

A COMPUTER PROGRAM
TO DETERMINE THE
POSSIBLE DAILY
RELEASE WINDOW FOR
SKY TARGET
EXPERIMENTS

MICHAUD

**CASE FILE
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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

A COMPUTER PROGRAM
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EXPERIMENTS

Prepared by

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Scientific and Technical Information Office

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington, D.C.

1973

For sale by the Superintendent of Documents,

U S Government Printing Office, Washington, D C 20402

Price \$2 60 domestic postpaid, \$2 25 G P O Bookstore Stock No 3300-00494

Library of Congress Catalog Card No 72-600340

Foreword

The National Aeronautics and Space Administration (NASA) and the Max Planck Institute for Extraterrestrial Physics (MPE), Munich, Germany, conducted a cooperative experiment involving the release and study of a barium cloud at a 31 500-km altitude near the equatorial plane. The release was made near local magnetic midnight on September 21, 1971.

This publication is based upon the computer program that was designed to meet the viewing requirements of the barium cloud experiment. The computer program can be adapted to similar sky target experiments if the launch requirements are suitably defined. Furthermore, experiment definitions requiring modifications to the existing program can be easily made because of the modular structure of the computer program.

The program was successfully designed with the assistance of C. Marshall Curtis, Edgar R. Everton, David W. Hancock III, Thomas J. Harmon, and Dennis F. Melvin, all of the Applied Mathematics Section, NASA Wallops Station.

N. H. M.

October 1972

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* Located inside of back cover on microfiche

Introduction

This computer program is designed to determine the daily release window for sky target experiments. Factors considered in the program are—

- (1) Target illumination by the Sun at release time and during the tracking period
- (2) Look angle elevation above local horizon from each tracking station to the target
- (3) Solar depression angle from the local horizon of each tracking station during the experimental period after target release
- (4) Lunar depression angle from the local horizon of each tracking station during the experimental period after target release
- (5) Total sky background brightness (i.e., light due to airglow, zodiacal light, and integrated starlight) as seen from each tracking station while viewing the target

The computer program defines a favorable time period for release of a sky target within a particular calendar time frame. The given output is not the favorable time period for vehicle launch. Launch time and payload release time must be considered separately.

Program output is produced in both graphic and data form. Output data can be plotted for a single calendar month or year. The numerical values used to generate the plots are furnished to permit a more detailed review of the computed daily release windows. A printout of the daily release window data computed for each constraint and applied to each tracking station is also furnished. Appendixes B and C show the logic and the program statements used in the program. (App. C may be found on microfiche on the inside back cover.) This output enables one to determine which program constraint and which tracking station closes the release window.

Input/Output Definition

PROGRAM INPUT

Card input required for the program is divided into two categories: computer system control cards and data cards. The system control cards, which assign the input/output (i/o) files to magnetic tape or disk, are used with the program options for program execution. Table 1 is a list of the necessary control cards. (See ref. 1 for additional information on the system control cards.) Those required for a given computer job are in the section of this document on program options.

Data cards contain the input data required for defining the program parameters. Each input parameter must be recorded in a specific manner on a data card. Nominal values for the input parameters are assigned to reduce the number of data cards required for program execution. Table 2 shows the breakdown of each input variable for a particular sky target experiment, as well as its nominal value and data-card location.

TABLE 1.—Computer System Control Cards

| Column | Columns | Columns | Columns | Remarks |
|--------|---------|---------|---------------------------|---|
| 1 | 2 to 7 | 8 to 11 | 16– | |
| \$ | blank | TAPE | 01,X1D,,,,SAVE1–556BPI | Required when plot tape is to be generated |
| \$ | blank | DISC | 07,X2R,5R | Required when data generated on file 07 are not to be saved |
| \$ | blank | TAPE | 07,X2D,,,,SAVE7 | Required when file 07 data are to be saved for further use |
| \$ | blank | TAPE | 07,X2D,,NNNN ^a | Required when previously generated file 07 data are program input |
| \$ | blank | DISC | 09,X3R,2R | Required when data generated on file 09 are not to be saved |
| \$ | blank | TAPE | 09,X3D,,,,SAVE9 | Required when file 09 data are to be saved for further use |
| \$ | blank | TAPE | 09,X3D,,NNNN ^a | Required when previously generated file 09 data are program input |
| \$ | blank | TAPE | 11,X4D,,,,SAVE11 | Required when file 11 data are to be saved for further use |
| \$ | blank | TAPE | 11,X4D,,NNNN ^a | Required when previously generated file 11 data are program input |
| \$ | blank | DISC | 11,X4R,5L | Required for multiple cases where magnetic tape is not specified. |
| \$ | blank | DISC | 12,X5R,5L | Required for computing stacked cases |
| \$ | blank | DISC | 13,X6R,5L | Required when performing calculations (ICALC=0) |

^a Insert appropriate 4-digit tape number in place of NNNN

TABLE 2.—Program Input Parameters

| Card code | Card columns | Variable name | Nominal value | Input units | Type (format) | Description |
|-----------|--------------|---------------|---------------|--------------------|---------------------------|--|
| BLANK | 2 to 80 | TITLE CARD | N/A | N/A | Alphanumeric (A1,13A6,A1) | Job title card |
| A | 01 | CARD CODE | TBA | N/A | Alphanumeric (A1) | Code value for data input card "A"—start/stop date |
| | 03, 04 | KMONTH | TBA | N/A | Integer (I2) | Starting month number |
| | 06, 07 | KDAY | TBA | N/A | Integer (I2) | Starting day number |
| | 09 to 12 | KYEAR | TBA | N/A | Integer (I4) | Starting year number |
| | 14, 15 | LMONTH | TBA | N/A | Integer (I2) | Final month number |
| | 17, 18 | LDAY | TBA | N/A | Integer (I2) | Final day number |
| | 20 to 23 | LYEAR | TBA | N/A | Integer (I4) | Final year number |
| B | 01 | CARD CODE | TBA | N/A | Alphanumeric (A1) | Start/stop date for printed and/or plotted output |
| | 03, 04 | KMO | TBA | N/A | Integer (I2) | Starting month number |
| | 06, 07 | KDA | TBA | N/A | Integer (I2) | Starting day number |
| | 09 to 12 | KYR | TBA | N/A | Integer (I4) | Starting year number |
| | 14, 15 | LMO | TBA | N/A | Integer (I2) | Final month number |
| | 17, 18 | LDA | TBA | N/A | Integer (I2) | Final day number |
| | 20 to 23 | LYR | TBA | N/A | Integer (I4) | Final year number |
| C | 01 | CARD CODE | TBA | N/A | Alphanumeric (A1) | Program options card ^a |
| | 04 | ICALC | TBA | N/A | Integer (I1) | Option on whether to skip program calculations and manipulate previously generated tapes or to do program calculations |
| | 06 | IPRT7 | TBA | N/A | Integer (I1) | Option to either print hard copy of file 7 or not |
| | 08 | IPRT9 | TBA | N/A | Integer (I1) | Option to either print hard copy of file 9 or not |
| | 10 | IPRT11 | TBA | N/A | Integer (I1) | Option to either create output file 11 data, use an existing file 11 tape, or not use file 11 |
| | 12 | IPLOT | TBA | N/A | Integer (I1) | Option to create a plot tape for a calendar year or calendar month or no plot tape |
| | | | | | | |
| D | 01 | CARD CODE | TBA | N/A | Alphanumeric (A1) | Sky target release point position card |
| | 06 to 15 | PHIPDG | TBA | Degrees north | Fixed point (F10 0) | Geodetic latitude of release point |
| | 16 to 25 | LAMPDG | TBA | Degrees east | Fixed point (F10 0) | Longitude of release point |
| | 26 to 35 | HEIGHT | TBA | Earth radii | Fixed point (F10 0) | Altitude of release point above Earth surface |
| E | 01 | CARD CODE | TBA | N/A | Alphanumeric (A1) | Program brightness and elevation constraints |
| | 06 to 10 | RESTR(2) | TBA | Degrees | Fixed point (F5 0) | Minimum look angle elevation from each tracking station to the sky target |
| | 11 to 15 | RESTR(3) | TBA | Degrees | Fixed point (F5 0) | Maximum depression angle of the Sun to each tracking station |
| | 16 to 20 | RESTR(4) | TBA | Degrees | Fixed point (F5 0) | Maximum depression angle of the Moon to each tracking station |
| | 21 to 25 | RESTR(5) | TBA | Rayleighs/angstrom | Fixed point (F5 0) | Maximum total sky background brightness |

INPUT/OUTPUT DEFINITION

TABLE 2. — Program Input Parameters — Continued

| Card code | Card columns | Variable name | Nominal value | Input units | Type (format) | Description |
|-----------|--------------|----------------|---------------|-------------|---------------------|--|
| F | 26 to 30 | RESTR(6) | TBA | km/sec | Fixed point (F5 0) | Constant longitudinal drift rate of target (Earth relative) |
| | 31 to 35 | RESTR(7) | TBA | Hours | Fixed point (F5 0) | Tracking period from time of release (should be given in multiples of 0.5 hr of time) |
| | 01 | CARD CODE | TBA | N/A | Alphanumeric (A1) | Stations considered in program |
| | 03, 04 | NS | TBA | N/A | Integer (I2) | Number of stations to be used |
| | 06, 07 | NOS(1) | TBA | N/A | Integer (I2) | Station number 1 ^b |
| | 09, 10 | NOS(2) | TBA | N/A | Integer (I2) | Station number 2 ^b |
| | 12, 13 | NOS(3) | TBA | N/A | Integer (I2) | Station number 3 ^b |
| | 15, 16 | NOS(4) | TBA | N/A | Integer (I2) | Station number 4 ^b |
| | 18, 19 | NOS(5) | TBA | N/A | Integer (I2) | Station number 5 ^b |
| | 21, 22 | NOS(6) | TBA | N/A | Integer (I2) | Station number 6 ^b |
| | 24, 25 | NOS(7) | TBA | N/A | Integer (I2) | Station number 7 ^b |
| | 27, 28 | NOS(8) | TBA | N/A | Integer (I2) | Station number 8 ^b |
| | 30, 31 | NOS(9) | TBA | N/A | Integer (I2) | Station number 9 ^b |
| | 33, 34 | NOS(10) | TBA | N/A | Integer (I2) | Station number 10 ^b |
| G | 36, 37 | NOS(11) | TBA | N/A | Integer (I2) | Station number 11 ^b |
| | 39, 40 | NOS(12) | TBA | N/A | Integer (I2) | Station number 12 ^b |
| | 01 | CARD CODE | TBA | N/A | Alphanumeric (3A6) | Tracking station positional data card (one set of tracking station parameters per card) |
| | 03, 04 | N | TBA | N/A | Integer (I2) | Station number (value of NOS(i) defined on "F" card) |
| | 05, 06 | MOVE(N) | TBA | N/A | Integer (I2) | Numeric code to determine if tracking station is Earth fixed (=0 for ground station) or moving with respect to the Earth (=1 for aircraft station) |
| | 08 to 25 | NAME (3,N) | TBA | N/A | Alphanumeric | Name of tracking station |
| H | 26 to 35 | PHI(N) | TBA | Degrees | Fixed point (F10 0) | Geodetic latitude of tracking station |
| | 36 to 45 | LAMBDA(N) | TBA | Degrees | Fixed point (F10 0) | Longitude of tracking station |
| | 46 to 55 | ALT(N) | TBA | Feet | Fixed point (F10 0) | Altitude of tracking station above Earth surface |
| | 01 | CARD CODE | TBA | N/A | Alphanumeric (A1) | Expected position of aircraft station position data card (one set of aircraft position parameters required for each 0.5 hr of expected tracking time after release) ^b |
| | 03, 04 | N | TBA | N/A | Integer | Aircraft station number (identical value with aircraft station number specified in columns 03, 04 of "G" card) |
| | 05, 06 | JAIR | TBA | N/A | Integer | Index used to identify the aircraft position with the time period after release (JAIR = integral value of 10 + 20 × current amount of hours after release) |
| | 08 to 25 | PNAME (3,JAIR) | TBA | N/A | Alphanumeric (3A6) | Name designated for aircraft position for index "JAIR" |
| | 26 to 35 | PLAT (JAIR) | TBA | Degrees | Fixed point (F10 0) | Geodetic latitude of aircraft position for time after release for index value "JAIR" |

TABLE 2.—Program Input Parameters—Concluded

| Card code | Card columns | Variable name | Nominal value | Input units | Type (format) | Description |
|-----------|--------------|---------------|---------------|-------------|---------------------|--|
| I | 36 to 45 | PLON (JAIR) | TBA | Degrees | Fixed point (F10 0) | Longitude of aircraft position for time after release for index value "JAIR " |
| | 46 to 55 | PALT (JAIR) | TBA | Feet | Fixed point (F10 0) | Altitude of aircraft position above Earth surface for time after release for index value "JAIR " |
| | 01 | CARD CODE | TBA | N/A | Alphanumeric | Final input data card |
| | 02 to 05 | ICASE | TBA | N/A | Integer (I2) | Case number |
| | 06, 07 | IFINAL | TBA | N/A | Integer (I2) | Code used for last input case, set to "1," otherwise leave blank |

N/A=not applicable, TBA=to be assigned.

^aSee table 3 for additional description of options described

^bStation numbers are numeric codes for input tracking stations. The maximum index (i) for NOS must be the numeric value of NS. Each tracking station used is assigned an integer on "G" card. This card is useful in designating any station

whose nominal value is specified and neglecting those preset stations not required. Additional stations may be read through "G" card with their station number specified here.

^cExpected position of aircraft station at time of target release specified with "G" card with MOVE(N)=01

Each data card, with the exception of the first or title card, contains an alphabetic code in column 1. Not all data cards are required for program execution. They are required only if one or more of the parameters for a particular card are to be changed from their nominal values. The data-card input rules are as follows:

- (1) The title card and the "I" card must be used for any program execution.
- (2) The cards coded "A" through "H" must be inserted (in any order) between the title card and the "I" card.
- (3) If one or more of the parameters required for a given card are to be changed from their nominal values, all parameters required for that input card must be present. A blank numeric field will then be interpreted as zero

Illustrations for three sample input cases are shown in figure 1. In (a), the program will execute using all the preset nominal values for the program. Execution requires only the title card and the "I" card. Case (c) is an example for a change of release point in which given tracking stations and calendar periods are used. An additional tracking station whose position is not preset is added to the input list. A variation of this would be to use only certain nominal-value tracking stations with no additional stations added.

MULTIPLE CASES

To fully evaluate launch criteria for a given calendar period, variation of certain input parameters must be considered. Several aspects of the vehicle behavior and the target's behavior after its release cannot be accurately predetermined. Therefore, proper analysis of the release window must incorporate the predicted vehicle dispersion area around the nominal release point and all possibilities of speed and direction of the target's motion after release.

The input card deck setup for multiple-case jobs is organized similarly to that for a single-deck setup. Each case must include the title card and the "I" card. For each case, the cards coded "A" through "H" need only be inserted if the parameters for that card are to be different from those of the previous case. (For the first case, the "A" through "H" cards are inserted only if the parameters change from the preset nominal values.)

As stated previously, stacked cases are for use in the analysis of release-point dispersion and drift-rate variations. Therefore, the program is designed so that any variation of the following parameters will either yield erroneous results or cause the program to prematurely terminate:

- (1) All parameters defined on cards coded "A," "B," "C," "F," "G," and "H"
- (2) The values for the minimum look angle elevation from each tracking station to the target and the maximum depression angles of the Sun and of the Moon to each tracking station

These values must remain constant after being defined in the first input case. An example of multiple case input is shown in figure 2.

Two additional computer system control cards are required for stacked cases. These cards are used to define temporary disk storage files for the calculated data for each case and are listed in table 1

PROGRAM OUTPUT

Output generated by this program is recorded on four computer system files. Through the existing program options, the data can be printed and/or plotted. Each of the four files yields different types of data useful for the user's analysis of the release window problem.

File 01 contains the release window data for either a year or a month in the format required by the CalComp Plotter Model 763. These data must be recorded at 556 bpi for the CalComp Plotter.

File 07 (800 bpi) contains the set of daily window times calculated for each constraint and for each tracking station.

File 09 (800 bpi) contains the set of daily release window times that satisfy all constraints for all tracking stations simultaneously. This set of data is the numerical listing of the data points recorded on tape file 01.

File 11 (800 bpi) contains the set of daily release window times calculated on the Sun and Moon constraints for each tracking station.

A sample of the output data generated from files 01, 07, and 09 are shown in figures 3, 4, and 5, respectively. Printed output of file 11 is not available because the purpose of this file is to omit the recalculation of the Sun and Moon constraint data for later program executions. It is anticipated that this program will be executed many times to analyze the variations of release point locations, target drift velocities, and expected target tracking periods using the same tracking stations. The use of file 11 then saves execution time by omitting the calculation of these data.

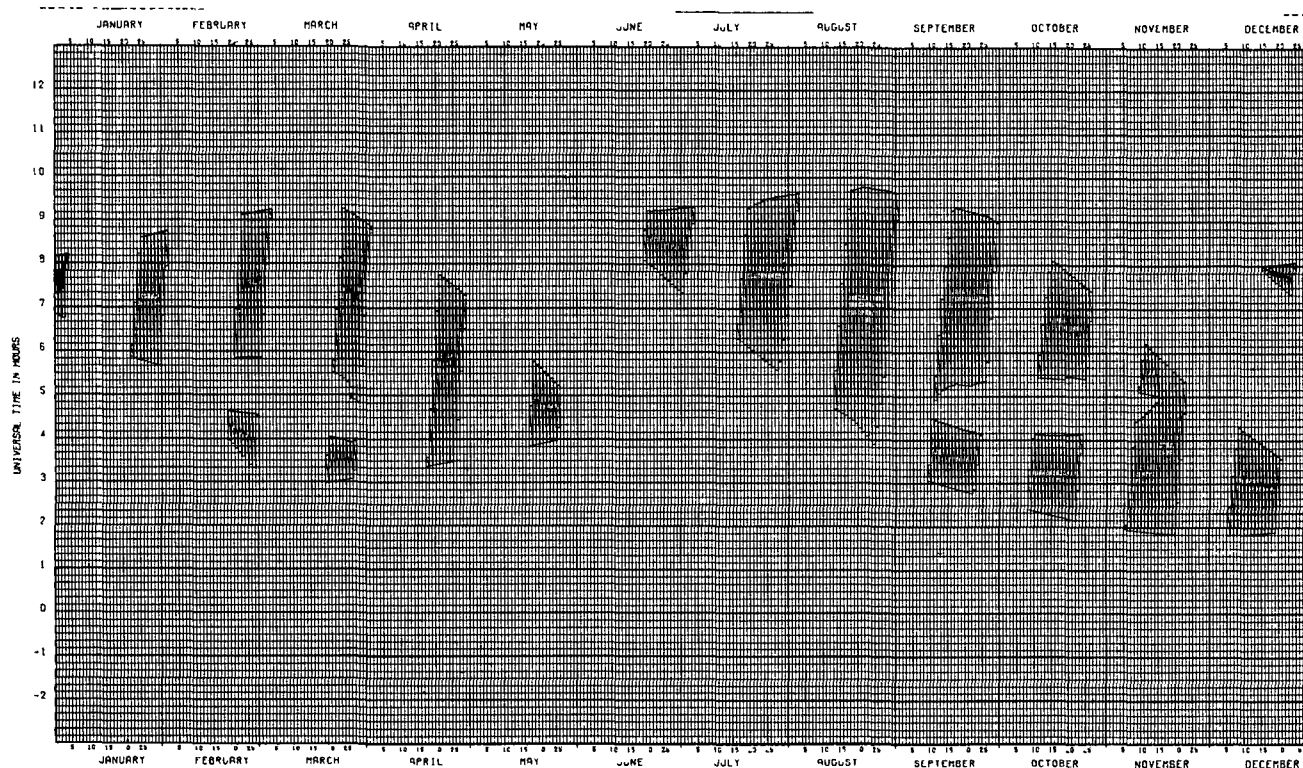
PROGRAM OPTIONS

The set of program options provides printed output flexibility and saves execution time by using data previously calculated

Table 3 is a list of program options including the integer value of each option code, the system files used, and the program options exercised. The integer value of each option code is the numerical value used for program input by the "C" card. For each system file required, the appropriate system control card (table 1) must be used. The seven program options in table 3 are

- (1) A: perform program calculations.
- (2) B: furnish printed output of file 07 data.
- (3) C: furnish printed output of file 09 data.
- (4) D: input a magnetic tape of file 11 data calculated from previous job.
- (5) E: create a magnetic tape of file 11 data for future jobs.
- (6) F: create a plot tape on file 01 of release window data for a calendar year.
- (7) G: create a plot tape on file 01 of release window data for a calendar month.

The input cards that must be furnished by the program user follow the "LIMITS" card and are the appropriate system control cards as defined in table 1 and the set of data cards with the title card first and the "I" card last.



MAX-PLANCK 10M CLOUD
RELEASE TIMES
FOR 1971

RELEASE POINT
LAT = 7 350
LONG = -74 990
ALT = 5 105

SUN ELEVATION = 19 0 DEG
MOON ELEVATION = 2 0 DEG
CLOUD ELEVATION = 30 0 DEG
SKY BRIGHTNESS = 1 5 R/A
CLOUD DRIFT = 0 00 KM/SEC
TRACKING TIME = 0 00 HRS
STATIONS COMBINED

LA SERENA CHILE
CERRO TOLLOLO CHILE
AREQUIPA PERU
WHITE SANDS NM
MT HOPKINS ARIZ
KITZ PEAK ARIZONA

PLOTTED
07/20/70

INPUT/OUTPUT DEFINITION

FIGURE 3 — Sample plot from file 01

DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

| *****RELEASE WINDOW DAILY TIME INTERVALS PER CONSTRAINT PER STATION***** | | | | | | | | |
|--|----------------|---------------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|
| DATE | CONSTRAINT | STATION | START HR/MIN | STOP HR/MIN | START HR/MIN | STOP HR/MIN | START HR/MIN | STOP HR/MIN |
| 1 AUG 1971 | EARTH SHADOW | ALL STATIONS | 0/0 | 0 | 24/0 | | | |
| | SUN | LA SERENA, CHILE | 0/27 | 10/5 | 23/33 | 34/4 | | |
| | | CERRO TOLOLO, CHILE | 0/27 | 10/6 | 23/32 | 34/6 | | |
| | | AREQUIPA, PERU | 0/11 | 9/56 | 23/48 | 33/55 | | |
| | | WHITE SANDS, N.M. | 1/37 | 10/47 | 27/36 | 34/48 | | |
| | | MT. HOPKINS, ARIZ. | 3/52 | 11/7 | 27/51 | 35/8 | | |
| | | KITT PEAK, ARIZONA | 3/56 | 11/9 | 27/55 | 35/10 | | |
| | MOON | LA SERENA, CHILE | 6/53 | 17/1 | 31/53 | 41/52 | | |
| | | CERRO TOLOLO, CHILE | 6/56 | 16/59 | 31/56 | 41/49 | | |
| | | AREQUIPA, PERU | 6/26 | 17/36 | 31/22 | 42/29 | | |
| | | WHITE SANDS, N.M. | 19/30 | 3/10 | 7/9 | 21/49 | | |
| | | MT. HOPKINS, ARIZ. | 19/10 | 2/54 | 7/29 | 22/5 | | |
| | | KITT PEAK, ARIZONA | 19/8 | 2/50 | 7/31 | 22/9 | | |
| | SKY BRIGHTNESS | LA SERENA, CHILE | 0/0 | 2/0 | 5/19 | 9/53 | 22/30 | 24/0 |
| | | CERRO TOLOLO, CHILE | 0/0 | 1/57 | 5/21 | 9/49 | 22/32 | 24/0 |
| | | AREQUIPA, PERU | 0/0 | 3/9 | 5/0 | 10/43 | 22/8 | 24/0 |
| | | WHITE SANDS, N.M. | 0/0 | 1/29 | 5/2 | 10/7 | 22/54 | 24/0 |
| | | MT. HOPKINS, ARIZ. | 0/0 | 1/8 | 5/15 | 9/41 | 23/10 | 24/0 |
| | | KITT PEAK, ARIZONA | 0/0 | 1/3 | 5/20 | 9/36 | 23/16 | 24/0 |
| 2 AUG 1971 | EARTH SHADOW | ALL STATIONS | 0/0 | 0 | 24/0 | | | |
| | SUN | LA SERENA, CHILE | 0/26 | 10/4 | 23/33 | 34/4 | | |
| | | CERRO TOLOLO, CHILE | 0/27 | 10/6 | 23/33 | 34/5 | | |
| | | AREQUIPA, PERU | 0/11 | 9/55 | 23/48 | 33/55 | | |

FIGURE 4 — Sample data from file 07

| *****TOTAL DAILY RELEASE WINDOW TIME INTERVALS***** | | | | | | | | | | | | |
|---|-----------------|-----------------------------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|
| DATE | START HR/MIN | STOP HR/MIN | START HR/MIN | STOP HR/MIN | START HR/MIN | STOP HR/MIN | START HR/MIN | STOP HR/MIN | START HR/MIN | STOP HR/MIN | START HR/MIN | STOP HR/MIN |
| 1 AUG 1971 | 7/31 | 9/36 | | | | | | | | | | |
| 2 AUG 1971 | 8/18 | 9/36 | | | | | | | | | | |
| 3 AUG 1971 | 9/13 | 9/37 | | | | | | | | | | |
| 4 AUG 1971 | *****NO | RELEASE WINDOW FOR THIS DATE***** | | | | | | | | | | |
| 5 AUG 1971 | *****NO | RELEASE WINDOW FOR THIS DATE***** | | | | | | | | | | |
| 6 AUG 1971 | *****NO | RELEASE WINDOW FOR THIS DATE***** | | | | | | | | | | |
| 7 AUG 1971 | *****NO | RELEASE WINDOW FOR THIS DATE***** | | | | | | | | | | |
| 8 AUG 1971 | *****NO | RELEASE WINDOW FOR THIS DATE***** | | | | | | | | | | |
| 9 AUG 1971 | *****NO | RELEASE WINDOW FOR THIS DATE***** | | | | | | | | | | |
| 10 AUG 1971 | *****NO | RELEASE WINDOW FOR THIS DATE***** | | | | | | | | | | |
| 11 AUG 1971 | *****NO | RELEASE WINDOW FOR THIS DATE***** | | | | | | | | | | |
| 12 AUG 1971 | *****NO | RELEASE WINDOW FOR THIS DATE***** | | | | | | | | | | |
| 13 AUG 1971 | *****NO | RELEASE WINDOW FOR THIS DATE***** | | | | | | | | | | |
| 14 AUG 1971 | 4/41 | 5/35 | | | | | | | | | | |
| 15 AUG 1971 | 4/38 | 6/36 | | | | | | | | | | |
| 16 AUG 1971 | 4/36 | 7/34 | | | | | | | | | | |
| 17 AUG 1971 | 4/33 | 8/27 | | | | | | | | | | |
| 18 AUG 1971 | 4/29 | 9/16 | | | | | | | | | | |
| 19 AUG 1971 | 4/26 | 9/42 | | | | | | | | | | |
| 20 AUG 1971 | 4/22 | 9/43 | | | | | | | | | | |
| 21 AUG 1971 | 4/16 | 9/45 | | | | | | | | | | |
| 22 AUG 1971 | 4/10 | 9/46 | | | | | | | | | | |
| 23 AUG 1971 | 4/5 | 9/46 | | | | | | | | | | |
| 24 AUG 1971 | 3/59 | 9/45 | | | | | | | | | | |
| 25 AUG 1971 | 3/53 | 9/45 | | | | | | | | | | |
| 26 AUG 1971 | 4/18 | 9/44 | | | | | | | | | | |
| 27 AUG 1971 | 4/50 | 9/44 | | | | | | | | | | |
| 28 AUG 1971 | 5/26 | 9/43 | | | | | | | | | | |
| 29 AUG 1971 | 6/10 | 9/42 | | | | | | | | | | |
| 30 AUG 1971 | 7/0 | 9/41 | | | | | | | | | | |
| 31 AUG 1971 | 7/58 | 9/40 | | | | | | | | | | |

FIGURE 5 — Sample data from file 09

TABLE 3.—Program Options

| Option No | Option code value | | | | | System files used ^a | | | | Options exercised | | | | | | |
|-----------|-------------------|-------|-------|--------|-------|--------------------------------|----|----|-----------------|-------------------|---|---|---|---|---|---|
| | ICALC | IPRT7 | IPRT9 | IPRT11 | IPLOT | 01 | 07 | 09 | 11 ^b | A | B | C | D | E | F | G |
| 1 | 0 | 0 | 0 | 0 | 0 | X | X | X | X | X | X | X | X | | X | |
| 2 | 0 | 0 | 0 | 0 | 0 | 1 | X | X | X | X | X | X | X | | | X |
| 3 | 0 | 0 | 0 | 0 | 0 | 2 | | X | X | X | X | X | X | | | |
| 4 | 0 | 0 | 0 | 0 | 1 | 0 | X | X | X | X | X | X | | X | X | |
| 5 | 0 | 0 | 0 | 0 | 1 | 1 | X | X | X | X | X | X | | X | | X |
| 6 | 0 | 0 | 0 | 0 | 1 | 2 | | X | X | X | X | X | | X | | |
| 7 | 0 | 0 | 0 | 0 | 2 | 0 | X | X | X | X | X | X | | | X | |
| 8 | 0 | 0 | 0 | 0 | 2 | 1 | X | X | X | X | X | X | | | | X |
| 9 | 0 | 0 | 0 | 0 | 2 | 2 | | X | X | X | X | X | | | | |
| 10 | 0 | 0 | 0 | 1 | 0 | 0 | X | X | X | X | X | | X | | X | |
| 11 | 0 | 0 | 0 | 1 | 0 | 1 | X | X | X | X | X | | X | | | X |
| 12 | 0 | 0 | 0 | 1 | 0 | 2 | | X | X | X | X | | X | | | |
| 13 | 0 | 0 | 0 | 1 | 1 | 0 | X | X | X | X | X | | | X | X | |
| 14 | 0 | 0 | 0 | 1 | 1 | 1 | X | X | X | X | X | | | X | | X |
| 15 | 0 | 0 | 0 | 1 | 1 | 2 | | X | X | X | X | | | X | | |
| 16 | 0 | 0 | 0 | 1 | 2 | 0 | X | X | X | X | X | | | | X | |
| 17 | 0 | 0 | 0 | 1 | 2 | 1 | X | X | X | X | X | | | | | X |
| 18 | 0 | 0 | 0 | 1 | 2 | 2 | | X | X | X | X | | | | | |
| 19 | 0 | 0 | 1 | 0 | 0 | 0 | X | X | X | X | | X | X | | X | |
| 20 | 0 | 0 | 1 | 0 | 0 | 1 | X | X | X | X | | X | X | | | X |
| 21 | 0 | 0 | 1 | 0 | 0 | 2 | | X | X | X | | X | X | | | |
| 22 | 0 | 0 | 1 | 0 | 1 | 0 | X | X | X | X | | X | | X | X | |
| 23 | 0 | 0 | 1 | 0 | 1 | 1 | X | X | X | X | | X | | X | | X |
| 24 | 0 | 0 | 1 | 0 | 1 | 2 | | X | X | X | | X | | X | | |
| 25 | 0 | 0 | 1 | 0 | 2 | 0 | X | X | X | X | | X | | | X | |
| 26 | 0 | 0 | 1 | 0 | 2 | 1 | X | X | X | X | | X | | | | X |
| 27 | 0 | 0 | 1 | 0 | 2 | 2 | | X | X | X | | X | | | | |
| 28 | 0 | 0 | 1 | 1 | 0 | 0 | X | X | X | X | | | X | | X | |
| 29 | 0 | 0 | 1 | 1 | 0 | 1 | X | X | X | X | | | X | | | X |
| 30 | 0 | 0 | 1 | 1 | 0 | 2 | | X | X | X | | | X | | | |
| 31 | 0 | 0 | 1 | 1 | 1 | 0 | X | X | X | X | | | | X | X | |
| 32 | 0 | 0 | 1 | 1 | 1 | 1 | X | X | X | X | | | | X | | X |
| 33 | 0 | 0 | 1 | 1 | 1 | 2 | | X | X | X | | | | X | | |
| 34 | 0 | 0 | 1 | 1 | 2 | 0 | X | X | X | X | | | | | X | |
| 35 | 0 | 0 | 1 | 1 | 2 | 1 | X | X | X | X | | | | | | X |

INPUT/OUTPUT DEFINITION

^a See table 1 for system control cards required for each system file^b Required when calculating multiple cases regardless of "IPRT11" value

TABLE 3.—Program Options—Concluded

| Option No | Option code value | | | | | System files used ^a | | | | Options exercised | | | | | | |
|-----------|-------------------|-------|-------|--------|-------|--------------------------------|----|----|-----------------|-------------------|---|---|---|---|---|---|
| | ICALC | IPRT7 | IPRT9 | IPRT11 | IPLOT | 01 | 07 | 09 | 11 ^b | A | B | C | D | E | F | G |
| 36 | 0 | 1 | 1 | 2 | 2 | | X | X | | X | | | | | | |
| 37 | 1 | 0 | 0 | N/A | 0 | X | X | X | | | X | X | | | X | |
| 38 | 1 | 0 | 0 | N/A | 1 | X | X | X | | | X | X | | | | X |
| 39 | 1 | 0 | 0 | N/A | 2 | | X | X | | | X | X | | | | |
| 40 | 1 | 0 | 1 | N/A | 0 | X | X | X | | | X | | | | X | |
| 41 | 1 | 0 | 1 | N/A | 1 | X | X | | | | X | | | | | X |
| 42 | 1 | 0 | 1 | N/A | 2 | | X | | | | X | | | | | |
| 43 | 1 | 1 | 0 | N/A | 0 | X | | X | | | | X | | | X | |
| 44 | 1 | 1 | 0 | N/A | 1 | X | | X | | | | X | | | | X |
| 45 | 1 | 1 | 0 | N/A | 2 | | | X | | | | X | | | | |
| 46 | 1 | 1 | 1 | N/A | 0 | X | | X | | | | | | | X | |
| 47 | 1 | 1 | 1 | N/A | 1 | X | | | | | | | | | | X |
| 48 | 1 | 1 | 1 | N/A | 2 | | | | | | | | | | | |

^a See table 1 for system control cards required for each system file^b Required when calculating multiple cases regardless of "IPRT11" value

Mathematical Analysis

Each requirement of a sky target experiment is considered separately in the program computations. Two assumptions made that affect the overall problem and are defined early in the program structure are.

- (1) The input position coordinates of each tracking station and of the target's release point use the Fisher Earth model.
- (2) The value used for the mean radius of the Earth and for the definition of one Earth radius is 6371.024 km.

Other assumptions are:

- (1) The program calculations use a spherical Earth model. This requires a transformation of input position coordinates from the given geodetic Earth model to the spherical Earth model of radius 6371.024 km.
- (2) The drift rate of the target after its release is constant, and the movement is in an east-west direction.
- (3) The position coordinates of any aircraft tracking station are given in half-hour increments from target release time. Aircraft position is treated as a set of discrete fixed locations rather than as a continuous flight pattern.
- (4) Release window calculations are accurate to within 1 min of time

The analysis for each constraint of the release window problem can now be defined.

TARGET ILLUMINATION

The sky target must be illuminated by the Sun throughout the experimental period. The time that the target passes into the Earth's shadow (umbra-penumbra region) must be determined. Initially, consider the target to be Earth fixed at a given geocentric latitude, longitude, and altitude above the Earth's center of mass. As such, the target may or may not pass through the Earth's shadow in a given 24-hr period. This event is a function of the Sun's declination, the target's declination, and the height of the target above the surface of the Earth.

Figure 6 illustrates a situation in which the target does not pass through the Earth's shadow. This occurs whenever the absolute value of the Sun's declination and the target's declination is greater than the angular radius of the Earth's shadow; that is,

$$|\delta_s + \delta_c| > r_s \quad (1)$$

where

δ_s = the Sun's declination in radians

δ_c = the target's declination in radians

r_s = the angular radius of the shadow in radians

Equation (1) results because the declination of the shadow's center is the negative of the Sun's declination.

Because δ_c is known and δ_s can be determined from an ephemeris table, r_s can be computed.

Figure 7 is used to illustrate the geometric relationships necessary for the solution of r_s .

The following variables are defined:

M = the mean distance in Earth radii units (ERU) between the Earth's and Sun's center of mass

P = the distance in ERU's from the Earth's center to the tip of the penumbra cone

H = the distance in ERU's of the target from the Earth's center

R_E = the radius in ERU's of the Earth

R_S = the radius in ERU's of the Sun

From similar triangles,

$$\frac{R_S}{M-P} = \frac{R_E}{P} \quad (2)$$

Because

$$R_E = 1$$

$$P = \frac{M}{R_S + 1}$$

The following angles, which are measured at the Earth's center of mass (fig. 7), are defined:

A = the angle in radians between the Earth-Sun line and the edge of the shadow region

B = the angle in radians between the edge of the shadow region and the tangency point of the Earth-Sun penumbra line

C = the angle in radians between the tangency point of the Earth-Sun penumbra line and the Earth-Sun line

$$A + B + C = \pi \text{ rad} \quad (3)$$

where

$$B = \arccos 1/H$$

$$C = \arccos 1/P = \arccos [(R_S + 1)/M]$$

Using the mean values of $R_S = 109.12R_E$ and $M = 23\,454.86R_E$,

$$C = 89^\circ 44' = 1.5661 \text{ rad}$$

equation (3) can be rearranged in the form

$$A = \frac{\pi}{2} - B + \frac{\pi}{2} - C$$

or

$$A = \arcsin \frac{1}{H} + 0.0045 \text{ rad} \quad (4)$$

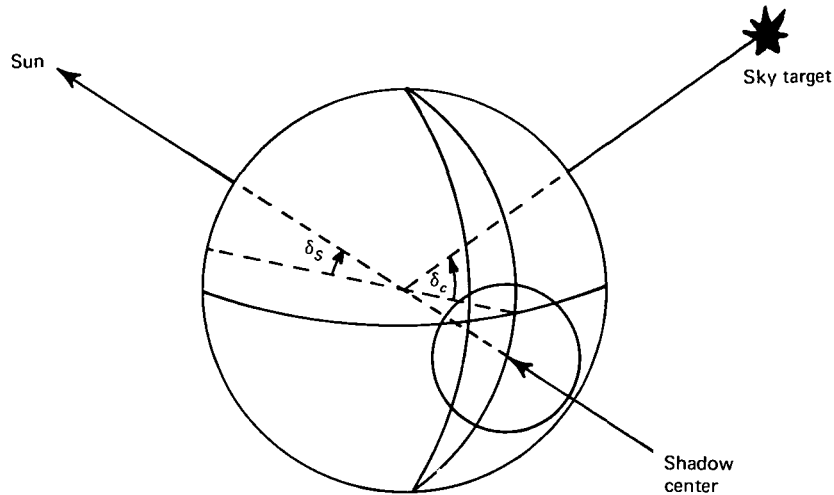


FIGURE 6 – Sky target outside Earth's shadow

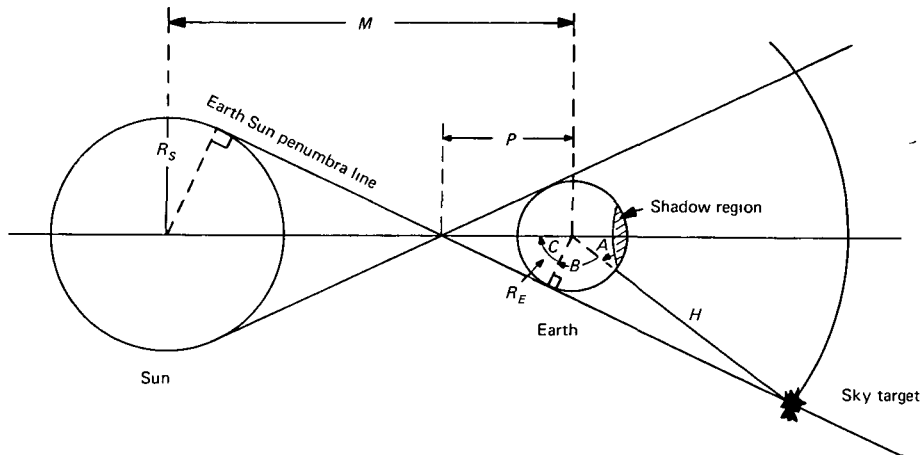


FIGURE 7 – Geometric relationships and shadow radius

The angular radius of the shadow

$$r_s = R_E A = A \text{ rad} \quad (5)$$

Therefore, equation (4) may be used to compute the radius of the shadow in radians, which is approximately 0.169 88 for a target distance $H = 6R_E$.

The time that any portion of the sky target is within the Earth's shadow can now be calculated. A cloud-type target is expected to grow in the direction of the geomagnetic poles and drift in the transverse direction after its release. It is assumed that cloud growth is constant and in a geographic north-south direction. Drift rate is assumed to be constant and in an east-west direction. A model of the cloud's behavior after its release can then be constructed.

Consider the target's release at some point (α_c, δ_c) , where

α_c = the right ascension of the release point measured positive eastward from the Greenwich meridian

δ_c = the declination of the release point

After release, the target will drift at some rate R_6 rad/hr and elongate along the magnetic-field lines at some rate of $2R_8$ rad/hr.

At the end of the experimental period, the extremities of the visible target will be at the points (α_1, δ_1) and (α_2, δ_2) and are defined as

$$\alpha_1 = \alpha_2 = \alpha_c + (R_6 + \omega)R_7 \quad (6)$$

$$\delta_1 = \delta_c + R_8 R_7 \quad (7)$$

$$\delta_2 = \delta_c - R_8 R_7 \quad (8)$$

where

R_7 = duration in hours of the experimental period

ω = rotational velocity of the Earth

The region covered by the target from time of release to the end of the experimental period is within a triangle as shown in figure 8. Note that the Earth's shadow region is described as a circle.

For a given day, the right ascension and declination of the Earth's shadow center is assumed fixed. The right ascension of the release point varies with respect to time. Imagine the Earth's shadow region fixed and the entire triangular-shaped region covered by the target moving at a constant rate of change of right ascension. The target's model will then intersect at some points with the Earth's shadow region provided that either

$$|\delta_1 - \delta_s| < r_s$$

or

$$|\delta_2 - \delta_s| < r_s$$

or

$$|\delta_c - \delta_s| < r_s$$

The problem then is to determine at what universal times must the sky target be released to avoid the Earth's shadow. To answer this, the points of intersection of each line segment of the triangle with the shadow region must be determined if a solution exists and is possible. If T_0^i is the time of release causing the target to enter the shadow region as determined for each line segment of the triangle ($i = 1, 2, 3$) and T_f^i is the time of release causing the target to exit the shadow region as determined for each line segment of the triangle ($i = 1, 2, 3$), then

$$T_0 = \min (T_0^1, T_0^2, T_0^3) \quad (9)$$

and

$$T_f = \max (T_f^1, T_f^2, T_f^3) \quad (10)$$

for valid solutions of T_0^i and T_f^i .

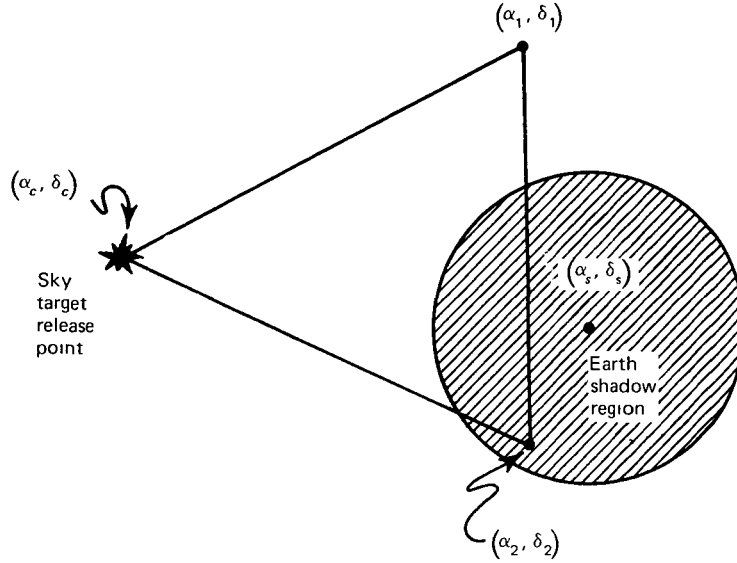


FIGURE 8 — Movement of sky target in Earth's shadow

The first point of contact of each line segment with the Earth's shadow region will be either at the endpoints of the line or at some point within the line segment.

Consider the case when the initial point of contact of the Earth's shadow region is a point within the line segment with endpoints (α_e, δ_e) and (α_1, δ_1) . The right ascension of the release points δ_e for which this line will be tangent to the Earth's shadow region must be determined. The slope of this line will remain constant, and its value is $R_8/(R_6 + \omega)$. The declination of the release point is time invariant and will also be constant. The intercept b_1 of the line at the time of tangency with the Earth shadow region can now be determined. The equation of the line is

$$\delta = \frac{R_8}{R_6 + \omega} \alpha + b_1 \quad (11)$$

for some point (α, δ) of the line segment.

The distance from the line (when tangent to the Earth's shadow region) to the center of the Earth's shadow is equal to the shadow radius, and

$$r_s = \frac{|R_8 \alpha_s - (R_6 + \omega) \delta_s + (R_6 + \omega) b_1|}{\sqrt{(R_6 + \omega)^2 + R_8^2}} \quad (12)$$

Solving for b_1 ,

$$b_1 = \frac{(R_6 + \omega) \delta_s - R_8 \alpha_s \pm r_s \sqrt{(R_6 + \omega)^2 + R_8^2}}{R_6 + \omega} \quad (13)$$

Therefore, the values of right ascension for the release point when the line is tangent to the Earth's shadow region is

$$\alpha_c = \frac{R_6 + \omega}{R_8} (\delta_c - b_1) \quad (14)$$

and the time of release is

$$t = \frac{\alpha_c - \lambda_c - \text{HA}_0}{1 + \Delta} \quad (15)$$

where

λ_c = the longitude of the target release point measured positive eastward from the Greenwich meridian

HA_0 = Greenwich hour angle of Aries at 0 hr universal time (UT) of the given day

$\Delta = 0.002\ 737\ 909$

Two values of b_1 are found from equation (13). Hence, two values for t are calculated, which represent the two points of tangency for the line to the Earth's shadow region. Because the right ascension of the release point will always move in one direction, the smaller value of t will always represent the time of entry into the Earth's shadow region.

In the other case, the relative position of the Earth's shadow region to the line segment could be such that the endpoints of the line segment will contact the Earth's shadow region at an earlier time. The point of contact will be at the edge of the Earth's shadow region and the distance from this point to the Earth's shadow center is equal to the shadow radius. Thus

$$(\alpha - \alpha_s)^2 + (\delta - \delta_s)^2 = r^2 \quad (16)$$

If the contact point is at the release point, set

$$\alpha_c = \alpha$$

and

$$\delta_c = \delta$$

Time of release is then found from equation (15). For the contact point to be (α_1, δ_1) , set

$$\alpha_1 = \alpha$$

$$\delta_1 = \delta$$

and the time of release is found by using equation (6) and then equation (15).

A similar analysis for both cases is used for the side of the triangle whose line segment is between points (α, δ) and (α_2, δ_2) . The slope for this line is

$$\frac{-R_8}{R_6 + \omega}$$

For the side of the triangle representing the position of the target at the end of the experiment, the slope of this line is 90° . The equation then would be

$$t = \frac{\alpha_s + (R_6 + \omega) R_7 \pm r_s - \lambda_c - \text{HA}_0}{1 + \Delta} \quad (17)$$

for the case $\delta_2 \leq \delta_s \leq \delta_1$.

Otherwise,

$$t = \frac{(R_6 + \omega) R_7 \pm \sqrt{r_s^2 - (\delta - \delta_s)^2} - \lambda_c - HA_0}{1 + \Delta} \quad (18)$$

where $\delta = \delta_1$ whenever $\delta_s > \delta_1$ and $\delta = \delta_2$ whenever $\delta_s < \delta_2$.

TARGET ELEVATION

Another factor considered in the program is the elevation look angle above local horizon from each tracking station to the sky target. The analysis of target elevation is generalized to permit look angle to be a variable rather than a fixed argument.

Consider an Earth-fixed tracking station located at point S_1 (fig. 9). Construct a vector from S_1 at an elevation angle of E deg. Rotating this vector about the point S_1 describes a conical shape with apex at S_1 . Any point within this described conical region will then have an elevation look angle greater than E deg from S_1 . The elevation constraint is satisfied whenever the target remains within the conical region for the duration of the experimental period.

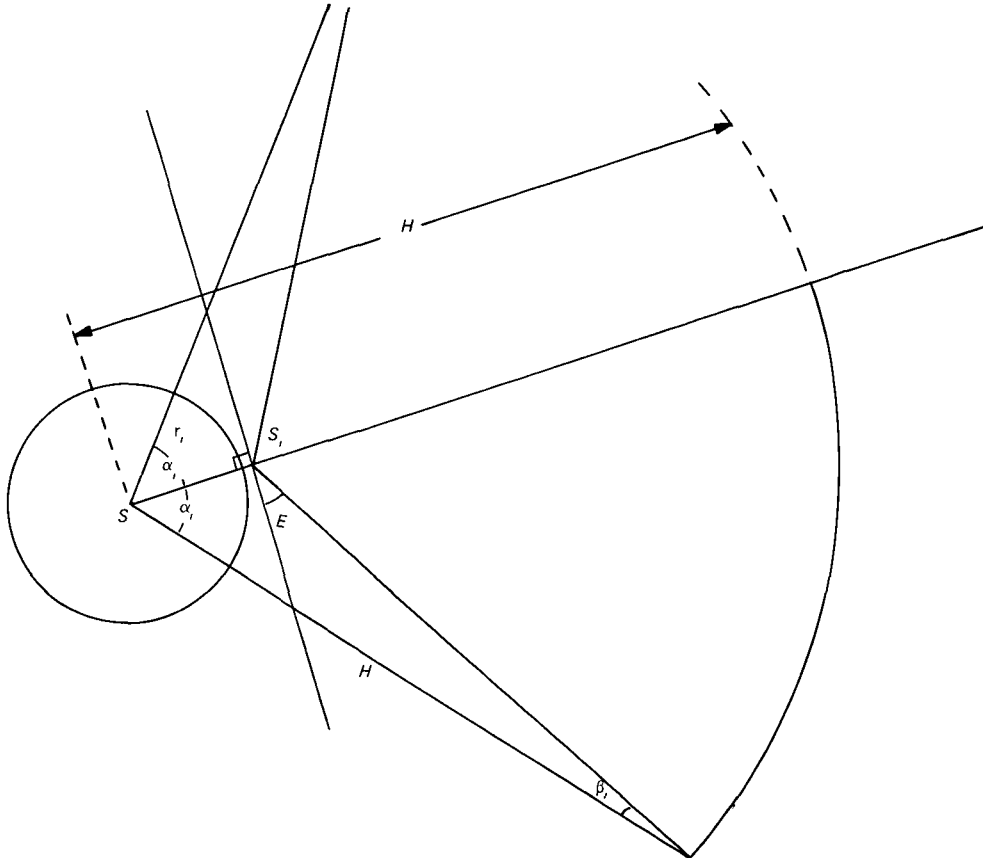


FIGURE 9 – Elevation look angle

From figure 9,

$$\frac{\sin \beta_i}{r_i} = \frac{\sin (\pi/2 + E)}{H} = \frac{\cos E}{H} \quad (19)$$

where

r_i = distance in ERU's from the Earth's center to S_i

H = distance in ERU's from the Earth's center to the target

β_i = angle in radians at the intersection of the height of the vector from S_i to the height of the target for elevation E and the vector H

Then,

$$\begin{aligned} \alpha_i &= \pi - (\pi/2 + E + \beta_i) \\ &= \frac{\pi}{2} - E - \arcsin \left(\frac{r_i}{H} \cos E \right) \end{aligned} \quad (20)$$

Project the base of this conical region onto the surface of the spherical Earth model. The shaded region shown in figure 10 is the region that satisfies the elevation constraint. The arc radius of the shaded region is

$$R_E \alpha_i = \alpha_i$$

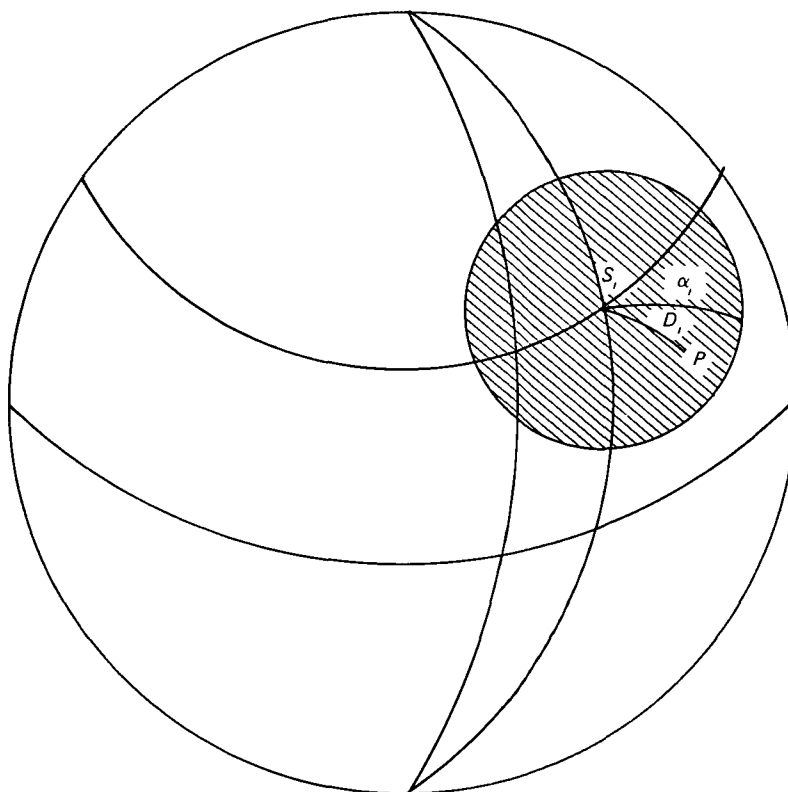


FIGURE 10 — Elevation constraint on Earth model

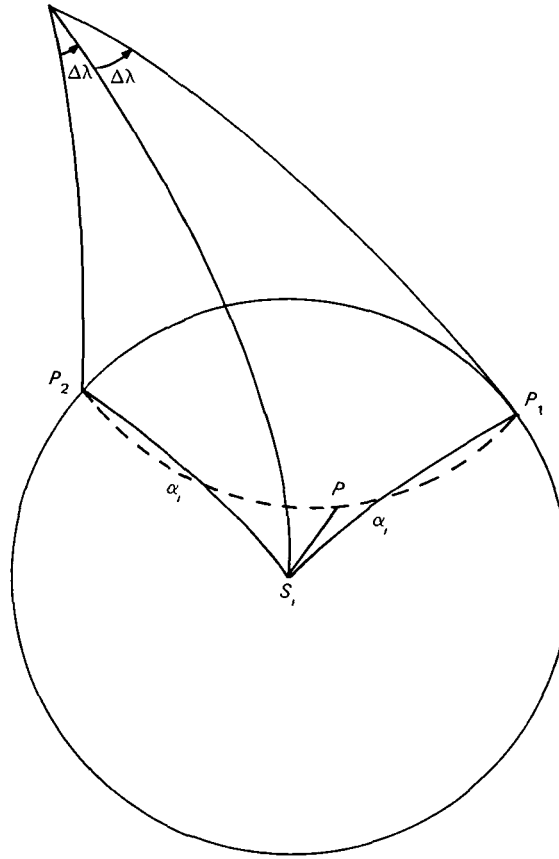


FIGURE 11 – Target drift on Earth model

Let P be the projection of the target release point onto the Earth's surface. The target has an elevation angle greater than E deg whenever the arc radius from S_i to P is less than α_i . Denote this arc radius as D_i . Using spherical trigonometry,

$$\cos D_i = \cos \left(\frac{\pi}{2} - \phi_i \right) \cos \left(\frac{\pi}{2} - \phi_c \right) + \sin \left(\frac{\pi}{2} - \phi_i \right) \sin \left(\frac{\pi}{2} - \phi_c \right) \cos (\lambda_i - \lambda_c) \quad (21)$$

where

(ϕ_i, λ_i) = geocentric latitude and longitude of tracking station S_i

(ϕ_c, λ_c) = geocentric latitude and longitude of the sky target projection at point P

The question arises of whether the target will drift out of the region during the experimental period. Because the assumed drift is in an east-west direction, the change in target position will be reflected as a longitudinal change only. Consider points P_1 and P_2 at the edge of the region at geocentric latitude ϕ_c (fig. 11). For an easterly drift, the target will move toward P_1 . The arc radius from S_i to P_1 or P_2 is α_i . From figure 11, we see that the differences in longitude, denoted by $\Delta\lambda$, between S_i and P_1 and between S_i and P_2 are equal. Then

$$\Delta\lambda = \arccos \frac{\cos \alpha_i - \sin \phi_i \sin \phi_c}{\cos \phi_i \cos \phi_c} \quad (22)$$

$$\lambda_1 = \lambda_i + \Delta\lambda \quad (23)$$

$$\lambda_2 = \lambda_i - \Delta\lambda \quad (24)$$

where

λ_1 = longitude in radians at point P_1

λ_2 = longitude in radians at point P_2

The time it will take a target to drift from P to P_1 (for an easterly drift) is

$$T = \left| \frac{\lambda_c - \lambda_1}{R_6} \right| \quad \text{hr} \quad (25)$$

and from P to P_2 (for a westerly drift) is

$$T = \left| \frac{\lambda_c - \lambda_2}{R_6} \right| \quad \text{hr} \quad (26)$$

where R_6 is the given drift rate in units of radians per hour.

If the total required tracking time is R_7 hr and $T \geq R_7$, where R_7 is the duration of the experimental period, then the elevation constraint is satisfied. If $T < R_7$, the program prints a statement naming the tracking station and giving the value of T . The program then continues with the remainder of its calculations.

When an aircraft is used as a tracking station, assume that the path and speed of the aircraft will be such that its position at target release and at the end of the experimental period are checked. Use these position coordinates to determine arc radius D_i . The elevation constraint is satisfied whenever $D_i < \alpha_i$ for both positions.

SUN AND MOON

The period for which the Sun and the Moon constraints will hold for a given tracking station i is initially approximated. Let (T_{0i}, T_{fi}) be the time period for the Sun (Moon) constraint to be satisfied at station i for a given day

Initially in hours,

$$T_{0i} = (19.0 - K\lambda_i) \bmod 24 \quad (27)$$

and

$$T_{fi} = (5.0 - K\lambda_i) \bmod 24 \quad (28)$$

where 19.0 and 5.0 are approximate astronomical twilight times at the Greenwich meridian. As before

K = conversion factor from radians to hours

λ_i = longitude in radians of tracking station i

Because the Moon is not on a yearly cycle, as is the Sun, an epoch date of January 0, 1970, is used in the initial approximation. For the Moon, again using approximate times of moonset (11.5 hr UT) and moonrise (0.0 hr UT) at the Greenwich meridian,

$$T_{0i} = [11.5 + 0.82 (J - J_0) - K\lambda_i] \bmod 24 \quad (29)$$

$$T_{fi} = [0.0 + 0.82 (J - J_0) - K\lambda_i] \bmod 24 \quad (30)$$

where

J = Julian date for the initial day

J_0 = Julian date for January 0, 1970

To determine an accurate time period (T_{0i} , T_{fi}) for the Sun's (Moon's) constraint to be met at station i , find the inertial rectangular coordinates of the Sun (Moon) for the initial time T_{0i} . Transforming these coordinates to a topocentric system (see app. A) with origin at S_i , we find the depression angle for the Sun (Moon) from S_i to be

$$E = \arcsin \frac{X}{r} \quad (31)$$

where

X = the topocentric X coordinate in ERU's for the Sun (Moon) at time T_{0i} ,

r = the distance in ERU's from S_i to the Sun (Moon)

Define R_3 as the depression angle constraint in radians of the Sun and R_4 as the depression angle constraint in radians of the Moon. If

$$\left| 1.0 - \frac{E}{R_3} \right| < 10^{-4} \quad (32)$$

then T_{0i} is the universal time for the beginning of the time period for the Sun constraint at station i .

For the Moon, equation (32) becomes

$$\left| 1.0 - \frac{E}{R_4} \right| < 10^{-4} \quad (33)$$

If either equation (32) or (33) is invalid, then a three-point interpolation is done to determine the T_{0i} that satisfies these equations. For this interpolation, set

$$\Delta t_1 = E - R_3 \quad (34)$$

$$E_1 = E \quad (35)$$

$$T_{0i} = T_{0i} + \Delta t_1 \quad (36)$$

Now compute the Sun's (Moon's) inertial coordinates for the new value of T_{0i} . Transforming to the topocentric coordinate system, a new value for E in equation (31) is found. If equation (32) or (35) is still invalid, then set

$$\Delta t_j = \left| \frac{t_{j-1}}{E - E_{j-1}} \right| (E - R_3) \quad (37)$$

(replace R_3 by R_4 in the case of the Moon):

$$E_j = E \quad (38)$$

and

$$T_{0i} = T_{0i} + \Delta t_j \quad (39)$$

This iterative procedure is to be repeated until equation (32) or (33) is satisfied or until $j = 15$. The program will stop if $j = 15$ because this system should converge rapidly.

To determine T_{f_i} , the same logic is used by replacing T_{0i} by T_{f_i} in the above equations. However, instead of equations (36) and (39) use

$$T_{f_i} = T_{f_i} - \Delta t_1$$

and

$$T_{f_i} = T_{f_i} - \Delta t_j.$$

respectively.

For these time periods to remain valid during the tracking of a sky target, subtract R_7 from T_{f_i} .

If the target is released at some time within $(T_{0i}, T_{f_i} - R_7)$, then the Sun's (Moon's) depression angle will be less than the required depression angle.

The positions of the aircraft at time of target release and at the end of the experimental period are used to determine its time interval satisfying the Sun and Moon constraints.

Let (t_0, t_f) be the interval found for the position of the aircraft at time of release, and let (t'_0, t'_f) be the interval found for the position of the aircraft at the end of the experimental period. Then, the time interval for the aircraft is the intersection of these two intervals

$$(T_{0i}, T_{f_i}) = (t_0, t_f) \cap (t'_0 - R_7, t'_f - R_7) \quad (40)$$

This is true for both the Sun and the Moon requirements.

TOTAL SKY BRIGHTNESS

Sky background brightness in the field of view of the optical instrumentation at each site is not to exceed R_5 rayleighs for a given wavelength. For practical purposes, consider only this brightness along the line of sight between each tracking station and the sky target.

The total sky brightness in rayleighs is expressed as being

$$B_{ti} = B_{ai} + (B_{si} + B_{zi}) (0.73^{\sec z_i}) \quad (41)$$

where

- B_{ti} = total sky brightness at a given point in the sky
- B_{ai} = the airglow brightness at the given point in the sky
- B_{si} = brightness of stars at the given point
- B_{zi} = brightness due to zodiacal light at the given point

Z_i = zenith angle in radians or the angle measured from station i 's zenith to the vector from station i to the release point.

$$B_{a1} = (0.8 \sec Z_i) (0.73^{\sec Z_i - 1}) \quad (42)$$

Before calculating B_{a1} from equation (41), the geometrical relationships between each station i and the target are defined with respect to time.

Airglow brightness is a function of angle Z_i . Let P be the position of the release point, and let S_i be the position of station i . Describe the coordinates for P and S_i in terms of these geodetic coordinates. That is

$$P = P(h'_p, \phi'_p, \lambda'_p)$$

$$S_i = S(h'_i, \phi'_i, \lambda'_i)$$

where

h'_p = altitude in ERU's of release point above the Earth's surface

ϕ'_p = geodetic latitude in radians of the release point

λ'_p = longitude in radians of the release point

h'_i = altitude in ERU's of station i above the Earth's surface

ϕ'_i = geodetic latitude in radians of station i

λ'_i = longitude in radians of station i

Now determine

- (1) \mathbf{u}_i = vector from the Earth's center to station i
- (2) \mathbf{v} = vector from the Earth's center to release point
- (3) \mathbf{w}_i = vector from station i to release point
- (4) \mathbf{u}'_i = unit vector coincident with the zenith of station i

These vectors are shown in figure 12.

The components of \mathbf{u}_i and \mathbf{v} are functions of the polar coordinates of the release point and of station i .

The rectangular components of \mathbf{u}_i and \mathbf{v} are

$$u_{ix} = r_i \cos \phi_i \cos \lambda_i \quad (43)$$

$$u_{iy} = r_i \cos \phi_i \sin \lambda_i \quad (44)$$

$$u_{iz} = r_i \sin \phi_i \quad (45)$$

and

$$v_x = r_p \cos \phi_p \cos \lambda_p \quad (46)$$

$$v_y = r_p \cos \phi_p \sin \lambda_p \quad (47)$$

$$v_z = r_p \sin \phi_p \quad (48)$$

where

r_i = radial distance in ERU's from the Earth's center to station i

ϕ_i = geocentric latitude in radians of station i

r_p = radial distance in ERU's from the Earth's center to the release point

ϕ_p = geocentric latitude in radians of the release point

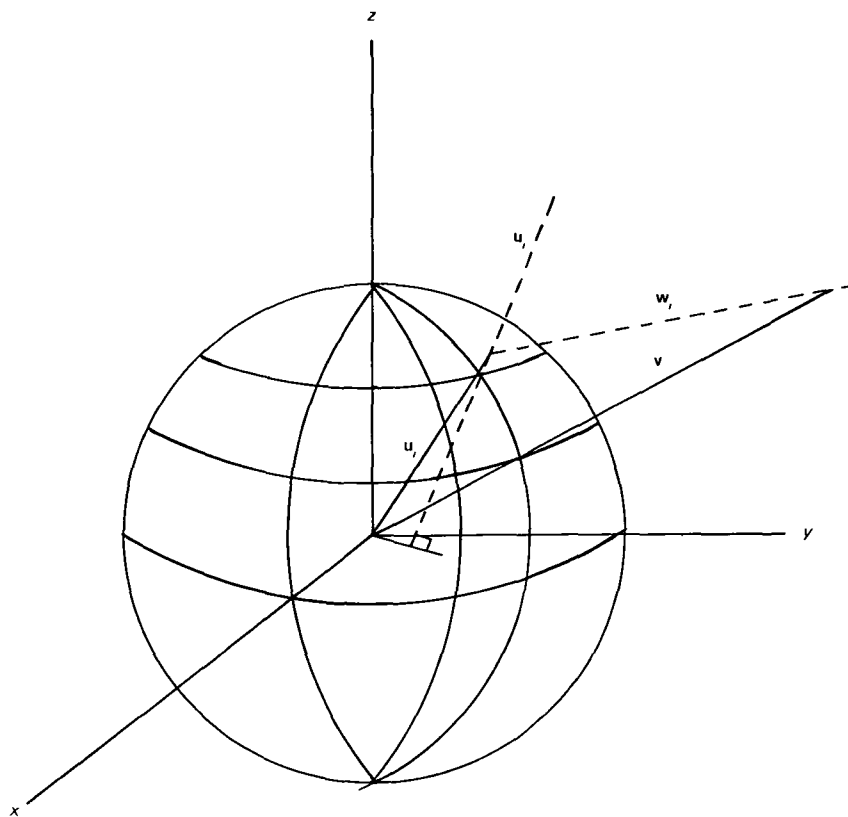


FIGURE 12 – Vectorial notation for sky brightness constraint

By definition

$$\mathbf{w}_i = \mathbf{v} - \mathbf{u}_i \quad (49)$$

The components of the unit vector \mathbf{u}'_i are

$$u'_{ix} = \cos \phi'_i \cos \lambda_i \quad (50)$$

$$u'_{iy} = \cos \phi'_i \sin \lambda_i \quad (51)$$

and

$$u'_{iz} = \sin \phi'_i \quad (52)$$

By the definition of the dot product of two vectors,

$$\cos Z_i = \frac{\mathbf{u}'_i \cdot \mathbf{w}_i}{|\mathbf{w}_i|}$$

or

$$\cos Z_i = \frac{1}{|\mathbf{w}_i|} [u'_{ix}w_{ix} + u'_{iy}w_{iy} + u'_{iz}w_{iz}] \quad (53)$$

Define

$$C_i = (0.73)^{\sec Z_i} \quad (54)$$

Then equation (42) becomes

$$B_{ai} = \frac{0.8 C_i}{0.73 \cos Z_i} \quad (55)$$

which is the airglow contribution to sky brightness from station i to the release point.

During the experimental period, the target has a drift rate of R_6 rad/hr relative to the Earth. The zenith angle and, hence, the airglow brightness will vary because of the change in direction of vector \mathbf{w}_i .

The Earth-relative position of the sky target t hours after release will be

$$P' = P' (r_p, \phi_p, \lambda'_p)$$

where

$$\lambda'_p = \lambda_p + R_6 t \quad (56)$$

Let \mathbf{w}_i be the vector from S_i to P' . Its geocentric rectangular coordinates are then

$$w'_{ix} = r_p \cos \phi_p \cos \lambda'_p - u_{ix}$$

$$w'_{iy} = r_p \cos \phi_p \sin \lambda'_p - u_{iy}$$

$$w'_{iz} = r_p \sin \phi_p - u_{iz}$$

Combining the results of equations (46), (47), and (48) with the result of equation (56),

$$w'_{ix} = v_x \cos R_6 t - v_y \sin R_6 t - u_{ix} \quad (57)$$

$$w'_{iy} = v_x \sin R_6 t + v_y \cos R_6 t - u_{iy} \quad (58)$$

$$w'_{iz} = v_z - u_{iz} \quad (59)$$

The geocentric rectangular coordinates of the aircraft's position t hours after release are appropriately used for component values u_{ix} , u_{iy} , and u_{iz} in the above three equations. Airglow brightness seen from the aircraft t hours after target release is found by using the results of these three equations in equations (53), (54), and (55).

ZODIACAL LIGHT AND STARLIGHT

The analysis for determining brightness due to zodiacal light and starlight must be investigated separately because the two light sources are time dependent. For the analysis, define the components of the vectors \mathbf{u}_i , \mathbf{v} , and \mathbf{w}_i in an inertial reference frame. The inertial reference frame is defined as a right-handed rectangular coordinate system with the x -axis directed toward the first

point of Aries, the z -axis coincident with the Earth's polar axis, and the y -axis completing the right-handed system. The origin of the system is at the Earth's center.

The z -axis of the inertial reference frame and of the geocentric reference frame are coincident. The angular difference between the inertial x -axis and the inertial y -axis and their respective axes in the geocentric coordinate system is the Greenwich hour angle HA. For some universal time T of a given day

$$HA = HA_0 + T(1.0 + \Delta) \quad (60)$$

where

HA_0 = the Greenwich hour angle in hours at zero hours UT of the given day
 $\Delta = 0.002\,737\,909$

The inertial components of vectors \mathbf{u}_i and \mathbf{v} are

$$u'_{ix} = |\mathbf{u}_i| \cos \phi_i \cos (HA + \lambda_i) \quad (61)$$

$$u'_{iy} = |\mathbf{u}_i| \cos \phi_i \sin (HA + \lambda_i) \quad (62)$$

$$u'_{iz} = u_{iz} = |\mathbf{u}_i| \sin \phi_i \quad (63)$$

$$v'_x = |\mathbf{v}| \cos \phi_p \cos (HA + \lambda_p) \quad (64)$$

$$v'_y = |\mathbf{v}| \cos \phi_p \sin (HA + \lambda_p) \quad (65)$$

$$v'_z = v_z = |\mathbf{v}| \sin \phi_p \quad (66)$$

Using the results of equations (43) through (48) and noting that $|\mathbf{u}_i| = r_i$ and $|\mathbf{v}| = r_p$, we have

$$u_{ix} = |\mathbf{u}_i| \cos \phi_i (\cos HA \cos \lambda_i - \sin HA \sin \lambda_i) \quad (67)$$

$$u'_{ix} = u_{ix} \cos HA - u_{iy} \sin HA$$

$$u_{iy} = |\mathbf{u}_i| \cos \phi_i (\sin HA \cos \lambda_i + \cos HA \sin \lambda_i) \quad (68)$$

$$u'_{iy} = u_{ix} \sin HA + u_{iy} \cos HA$$

For \mathbf{v} ,

$$v'_x = v_x \cos HA - v_y \sin HA \quad (69)$$

$$v'_y = v_x \sin HA + v_y \cos HA \quad (70)$$

The components of \mathbf{w}_i are defined by equation (49).

The zodiacal light brightness and the starlight brightness in the direction of \mathbf{w}_i are found in appropriate tables. Values of zodiacal light brightness for given ecliptic latitude versus elongation are found in table 4, and values for starlight brightness versus inertial latitude and longitude are found in table 5. Both tables are in units of 10th visual magnitude stars per square degree. The zodiacal light

TABLE 4.—*Zodiacal Light in 10th Visual Magnitude Stars deg⁻²*

| Ecliptic latitude β | Elongation (celestial longitude minus mean longitude of Sun, $\lambda - \lambda_0$) | | | | | | | | | | | | | | | | | | |
|---------------------------------|--|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 |
| 90 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| 80 | 80 | 79 | 78 | 77 | 74 | 73 | 73 | 73 | 72 | 72 | 72 | 72 | 72 | 71 | 71 | 71 | 71 | 71 | 71 |
| 70 | 105 | 101 | 99 | 96 | 90 | 83 | 80 | 78 | 76 | 76 | 76 | 75 | 75 | 75 | 74 | 74 | 74 | 74 | 73 |
| 60 | 135 | 131 | 125 | 117 | 107 | 98 | 93 | 90 | 86 | 84 | 83 | 83 | 82 | 82 | 81 | 81 | 80 | 79 | 78 |
| 50 | 180 | 170 | 160 | 150 | 135 | 123 | 112 | 101 | 97 | 94 | 93 | 90 | 89 | 88 | 87 | 87 | 87 | 86 | 85 |
| 40 | 270 | 250 | 220 | 190 | 175 | 155 | 143 | 130 | 118 | 108 | 103 | 99 | 98 | 97 | 95 | 94 | 93 | 93 | 93 |
| 30 | 460 | 400 | 360 | 300 | 260 | 200 | 180 | 160 | 146 | 133 | 120 | 112 | 108 | 106 | 105 | 105 | 106 | 108 | 108 |
| 20 | 800 | 700 | 610 | 500 | 390 | 300 | 250 | 200 | 175 | 155 | 143 | 129 | 122 | 118 | 117 | 120 | 124 | 127 | 130 |
| 10 | 1400 | 1200 | 1000 | 960 | 700 | 480 | 350 | 270 | 220 | 185 | 165 | 149 | 135 | 128 | 126 | 130 | 136 | 143 | 146 |
| 0 | 3000 | 1800 | 1500 | 1200 | 950 | 700 | 430 | 310 | 250 | 200 | 180 | 160 | 145 | 136 | 133 | 138 | 146 | 160 | 180 |

TABLE 5.—*Starlight in 10th*

| Inertial latitude, deg | Inertial | | | | | | | | | | | | | | | | | | |
|------------------------------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 |
| 90 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 |
| 80 | 71 | 71 | 71 | 71 | 70 | 70 | 68 | 67 | 64 | 62 | 59 | 55 | 53 | 51 | 49 | 48 | 48 | 47 | 47 |
| 70 | 87 | 82 | 76 | 70 | 67 | 68 | 73 | 76 | 74 | 69 | 63 | 56 | 51 | 48 | 46 | 44 | 42 | 41 | 41 |
| 60 | 209 | 186 | 168 | 148 | 120 | 90 | 69 | 68 | 77 | 76 | 68 | 58 | 51 | 45 | 42 | 40 | 38 | 37 | 35 |
| 50 | 154 | 140 | 129 | 121 | 120 | 127 | 151 | 108 | 81 | 81 | 73 | 62 | 53 | 45 | 40 | 37 | 34 | 33 | 32 |
| 40 | 113 | 100 | 87 | 78 | 77 | 85 | 102 | 164 | 161 | 105 | 81 | 66 | 57 | 45 | 38 | 33 | 30 | 31 | 30 |
| 30 | 75 | 69 | 64 | 58 | 51 | 50 | 64 | 88 | 195 | 189 | 109 | 76 | 61 | 48 | 37 | 31 | 29 | 27 | 28 |
| 20 | 49 | 47 | 48 | 47 | 45 | 44 | 47 | 65 | 90 | 276 | 179 | 98 | 73 | 53 | 39 | 32 | 29 | 28 | 30 |
| 10 | 37 | 36 | 37 | 39 | 40 | 41 | 45 | 58 | 80 | 138 | 270 | 142 | 96 | 65 | 45 | 35 | 32 | 32 | 32 |
| 0 | 34 | 32 | 32 | 35 | 37 | 39 | 45 | 60 | 87 | 112 | 289 | 182 | 133 | 86 | 55 | 42 | 37 | 36 | 36 |
| -10 | 35 | 32 | 31 | 33 | 34 | 36 | 45 | 60 | 93 | 133 | 197 | 263 | 154 | 114 | 71 | 53 | 47 | 43 | 43 |
| -20 | 36 | 32 | 32 | 32 | 33 | 36 | 45 | 59 | 87 | 137 | 203 | 368 | 200 | 139 | 94 | 67 | 58 | 55 | 54 |
| -30 | 34 | 36 | 33 | 32 | 33 | 37 | 45 | 58 | 78 | 117 | 202 | 321 | 459 | 209 | 123 | 85 | 73 | 72 | 73 |
| -40 | 33 | 34 | 35 | 34 | 35 | 38 | 45 | 55 | 70 | 92 | 153 | 276 | 458 | 572 | 269 | 156 | 101 | 96 | 101 |
| -50 | 38 | 37 | 37 | 37 | 37 | 39 | 44 | 53 | 63 | 77 | 103 | 186 | 302 | 489 | 742 | 484 | 312 | 244 | 214 |
| -60 | 44 | 42 | 40 | 40 | 40 | 42 | 46 | 51 | 59 | 69 | 78 | 111 | 173 | 241 | 318 | 514 | 694 | 682 | 608 |
| -70 | 50 | 48 | 46 | 45 | 45 | 47 | 49 | 53 | 58 | 65 | 69 | 79 | 98 | 126 | 154 | 176 | 200 | 217 | 233 |
| -80 | 56 | 55 | 54 | 54 | 54 | 55 | 57 | 59 | 61 | 64 | 65 | 68 | 73 | 78 | 84 | 91 | 98 | 104 | 108 |
| -90 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 |

table was adopted from figure 5 of reference 2 and the starlight table was adopted from reference 3. The definition of the ecliptic coordinate system is found in reference 4. Interpolation of these tables gives the sky brightness due to zodiacal light B_z and starlight B_s in the direction of vector w_i at universal time t . The total sky background brightness for this time is calculated from equation (41).

The computation of B_{ti} for universal time t has been described. The problem is to find the time interval (T_{0i}, T_{fi}) for which the total sky background brightness B_{ti} is less than R_5 . The method used for this computation is to calculate B_{ti} at half-hour increments during a given day for each station i .

Whenever two consecutive total sky brightness values are found such that one meets the constraint and the other exceeds it, a two-point iterative procedure is used to find the appropriate bounds of the time interval. Whether the total sky background brightness is less than R_5 during the experimental period must also be determined.

The Earth-relative components of the vector from S_i to P' are given in equations (57), (58), and (59). Transforming these components into the appropriate coordinate system, the zodiacal light and starlight brightness are found for t hours after cloud release. Combining these values with arglow brightness at time t will give B_{ti} . Whenever B_{ti} is less than R_5 for $0 < t < R_7$, then t is within the interval (T_{0i}, T_{fi}) .

Visual Magnitude Stars deg⁻²

| longitude, deg | | | | | | | | | | | | | | | | | | |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 | 320 | 330 | 340 | 350 | 360 | |
| 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 | 57 |
| 47 | 47 | 48 | 49 | 50 | 52 | 53 | 55 | 57 | 59 | 61 | 63 | 65 | 67 | 68 | 69 | 70 | 71 | 71 |
| 41 | 41 | 42 | 44 | 46 | 49 | 53 | 57 | 62 | 66 | 71 | 75 | 79 | 84 | 89 | 92 | 91 | 87 | 87 |
| 35 | 36 | 37 | 39 | 42 | 47 | 54 | 61 | 70 | 82 | 93 | 103 | 123 | 152 | 194 | 230 | 227 | 209 | 209 |
| 32 | 31 | 32 | 35 | 39 | 46 | 55 | 68 | 86 | 110 | 131 | 158 | 233 | 368 | 288 | 199 | 171 | 154 | 154 |
| 29 | 28 | 30 | 33 | 37 | 45 | 57 | 75 | 110 | 149 | 161 | 231 | 410 | 245 | 186 | 154 | 129 | 113 | 113 |
| 31 | 29 | 31 | 34 | 38 | 46 | 61 | 86 | 133 | 172 | 162 | 348 | 237 | 162 | 108 | 87 | 81 | 75 | 75 |
| 29 | 31 | 33 | 35 | 39 | 47 | 65 | 95 | 138 | 134 | 209 | 231 | 155 | 89 | 67 | 60 | 53 | 49 | 49 |
| 31 | 32 | 36 | 38 | 42 | 52 | 70 | 94 | 120 | 120 | 245 | 165 | 102 | 67 | 54 | 47 | 40 | 37 | 37 |
| 36 | 36 | 40 | 42 | 47 | 57 | 71 | 87 | 106 | 183 | 179 | 141 | 85 | 61 | 49 | 42 | 37 | 34 | 34 |
| 43 | 45 | 47 | 49 | 54 | 65 | 74 | 94 | 137 | 254 | 179 | 130 | 80 | 58 | 48 | 41 | 38 | 35 | 35 |
| 55 | 55 | 59 | 61 | 69 | 79 | 95 | 145 | 299 | 238 | 191 | 120 | 75 | 55 | 45 | 39 | 37 | 36 | 36 |
| 75 | 78 | 83 | 93 | 108 | 131 | 180 | 321 | 375 | 255 | 164 | 103 | 71 | 54 | 44 | 38 | 35 | 34 | 34 |
| 111 | 126 | 146 | 175 | 201 | 236 | 382 | 531 | 333 | 218 | 125 | 88 | 67 | 54 | 45 | 39 | 36 | 33 | 33 |
| 213 | 232 | 256 | 281 | 332 | 529 | 540 | 360 | 246 | 140 | 94 | 78 | 66 | 57 | 50 | 45 | 40 | 38 | 38 |
| 557 | 547 | 568 | 580 | 511 | 336 | 287 | 214 | 112 | 94 | 78 | 71 | 65 | 60 | 55 | 51 | 47 | 44 | 44 |
| 243 | 242 | 231 | 216 | 196 | 173 | 146 | 113 | 88 | 75 | 70 | 67 | 63 | 61 | 58 | 55 | 52 | 50 | 50 |
| 110 | 110 | 107 | 102 | 96 | 89 | 82 | 76 | 71 | 68 | 66 | 65 | 62 | 61 | 59 | 58 | 57 | 56 | 56 |
| 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 |

Summary

The analysis presented herein is a guide for use of the computer program. The program is intended to compute the daily release window for sky target experiments for the specific requirements of each project. Flexibility in programming techniques was used as much as possible so that the program could be adapted for all projects with similar requirements. A combined window using a maximum of 12 fixed stations or a maximum of 10 fixed stations and one aircraft may be computed. The window output is accurate to within 1 min of time.

References

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- 2 DUMONT, RENE Photometry of Zodiacal Light and Atmospheric Continuum by H-M Method and Barbier Correlations, and Tenerife Results About the Shape of the Zodiacal Cloud The Zodiacal Light and the Interplanetary Medium, NASA SP-150, 1967, pp 63-69
- 3 ROACH, F E, AND MEGILL, LAWRENCE R Integrated Starlight Over the Sky *Astrophys J*, vol 133, Jan-May 1961, pp 228-242
- 4 Explanatory Supplement to the Astronomical Ephemeris and the American Ephemeris and Nautical Almanac Her Majesty's Stationery Office (London), 1961, pp 24-27

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Appendix A

Coordinate Transformations

GEODETIC TO GEOCENTRIC

Let P be a point above the Earth's surface with coordinates (h, ϕ_g, λ) , where

- h = height of the point above the Earth's surface
- ϕ_g = geodetic latitude in radians of the point
- λ = longitude in radians of the point

Let Q be a projection of P onto the Earth's surface. Consider the points P and Q in two dimensions as seen on figure A-1. This figure represents a quarter of an ellipsoid cut along a meridian plane. Let

- a = semimajor axis in kilometers of the ellipse (in the x direction)
- b = semiminor axis in kilometers of the ellipse (in the y direction)

The general equation of an ellipse is

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \quad (\text{A-1})$$

For the Earth's ellipsoid, several geoids have been described. In this analysis, the Fischer Earth model is used, where $a = 6378.166$ km and the Earth's flattening $F = 1/298.30$. By definition,

$$F = \frac{a - b}{a}$$

or

$$b = a - aF = a(1 - F)$$

We can now determine the coordinates of point Q in figure A-1 as measured from the origin O .

From equation (A-1),

$$\begin{aligned} \frac{x^2}{a^2} + \frac{y^2}{b^2} &= 1 \\ b^2x^2 + a^2y^2 &= a^2b^2 \\ y^2 &= \frac{a^2b^2 - b^2x^2}{a^2} \\ y &= \frac{b}{a} \sqrt{a^2 - x^2} \end{aligned} \quad (\text{A-2})$$

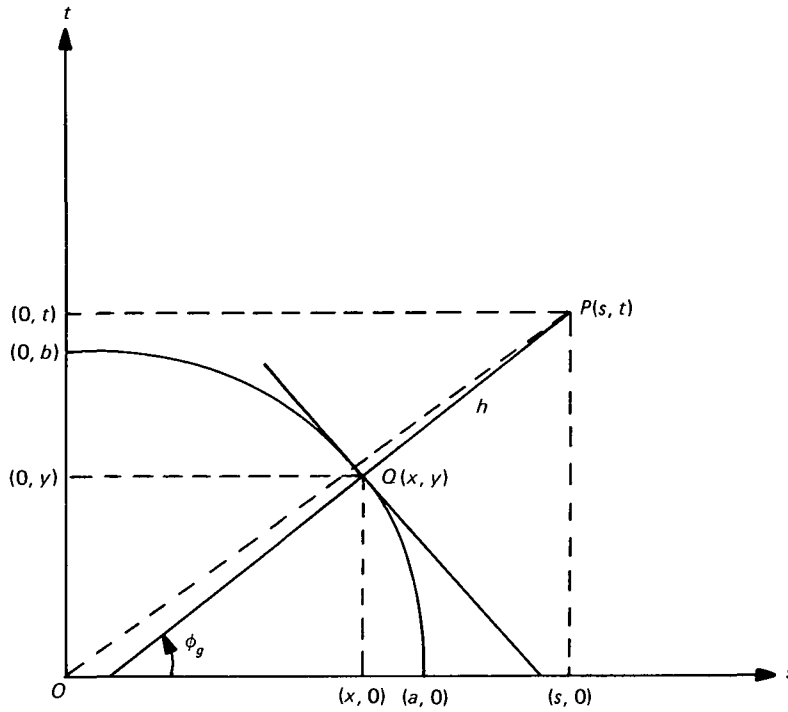


FIGURE A-1 — Geodetic coordinate system

Differentiating equation (A-1),

$$\frac{2x}{a^2} dx + \frac{2y}{b^2} dy = 0$$

$$b^2 x dx + a^2 y dy = 0 \quad (\text{A-3})$$

$$\frac{dy}{dx} = \frac{-b^2 x}{a^2 y}$$

gives the slope of the line tangent to the ellipse at Q . The line perpendicular to this tangent has its slope equal to $-1/(dy/dx)$. This, by definition, is the tangent of the geodetic latitude ϕ_g . Hence,

$$-\frac{dx}{dy} = \tan \phi_g \quad (\text{A-4})$$

Combining equations (A-3) and (A-4),

$$\tan \phi_g = \frac{a^2 y}{b^2 x}$$

or

$$y = \frac{b^2 x \tan \phi_g}{a^2} \quad (\text{A-5})$$

Combining equations (A-5) and (A-2),

$$\frac{b}{a} \sqrt{a^2 - x^2} = \frac{b^2}{a^2} x \tan \phi_g$$

Solving for x

$$(a^2 - x^2) = \frac{b^2}{a^2} x^2 \tan^2 \phi_g$$

$$a^4 - a^2 x^2 = b^2 x^2 \tan^2 \phi_g$$

$$x^2 = \frac{a^4}{a^2 + b^2 \tan^2 \phi_g}$$

$$x = \pm \frac{a^2}{\sqrt{a^2 + b^2 \tan^2 \phi_g}}$$

From figure A-1 and the problem definition, we see that the x value is always positive. Hence,

$$x = \frac{a^2}{\sqrt{a^2 + b^2 \tan^2 \phi_g}} \quad (\text{A-6})$$

We now resolve the values of the coordinates (s , t) of point P as measured from the origin.

$$P_s = x + h \cos \phi_g \quad (\text{A-7})$$

$$P_t = y + h \sin \phi_g \quad (\text{A-8})$$

Define the point P in a three-dimensional coordinate system with the x -axis in the direction of the Greenwich meridian, the z -axis as the Earth's polar axis, and the y -axis completing the right-handed system.

To define P in this coordinate system (as shown in fig. A-2), recall that our two-dimensional ellipse defined in figure A-1 was cut along the longitude meridian of P . Hence P_s is the resultant component of P_x and P_y in the x , y plane of figure A-2 and $P_z = P_t$. Therefore,

$$P_x = P_s \cos \lambda \quad (\text{A-9})$$

$$P_y = P_s \sin \lambda \quad (\text{A-10})$$

$$P_z = P_t \quad (\text{A-11})$$

The radius vector in kilometers is

$$R = \sqrt{P_x^2 + P_y^2 + P_z^2} \quad (\text{A-12})$$

and the geocentric latitude in radians is

$$\phi_c = \arcsin \frac{P_z}{R} \quad (\text{A-13})$$

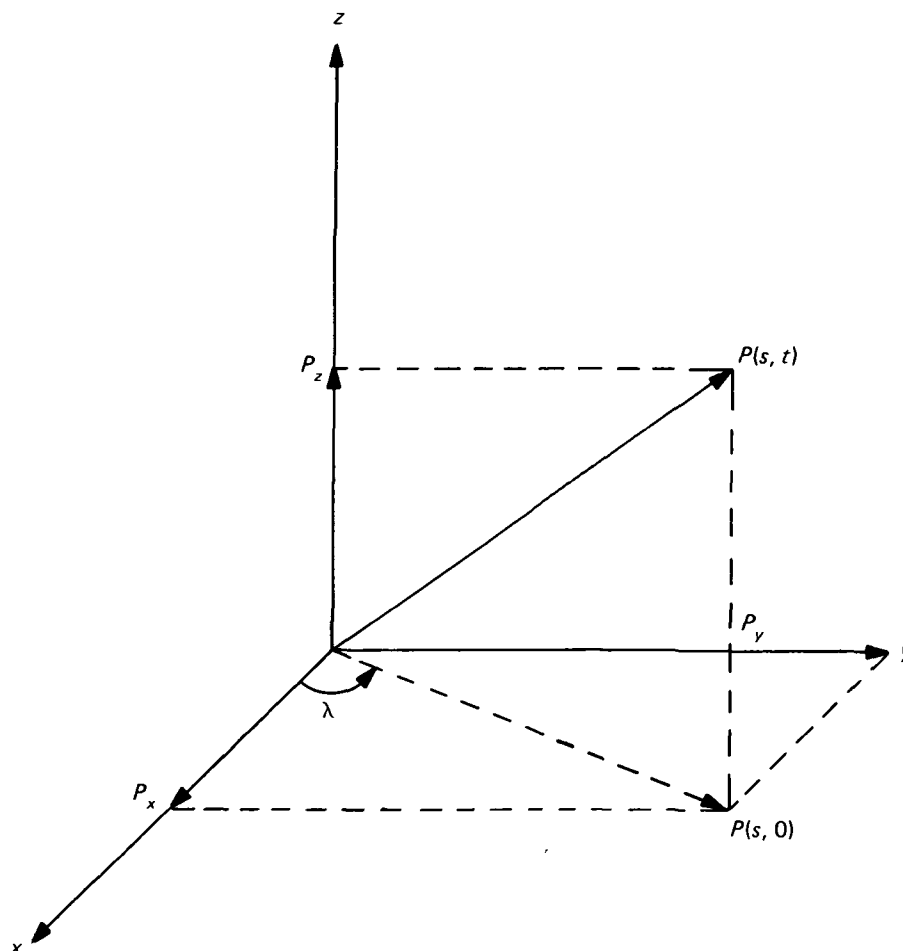


FIGURE A-2 — Geocentric coordinate system

INERTIAL TO GEOCENTRIC

The inertial coordinate system is defined as a right-handed coordinate system with origin at the Earth's center, the x-axis directed toward the first point of Aries, the z-axis directed toward the polar axis, and the y-axis in the equatorial plane completing the system.

For this transformation, define the sidereal hour angle HA as the angle measured in the equatorial plane from the first point of Aries to the Greenwich meridian at some time t . Let P be a vector in the inertial coordinate system with components

$$P'_x = |P| \cos \phi_c \cos \lambda \quad (\text{A-14})$$

$$P'_y = |P| \cos \phi_c \sin \lambda \quad (\text{A-15})$$

$$P'_z = |P| \sin \phi_c \quad (\text{A-16})$$

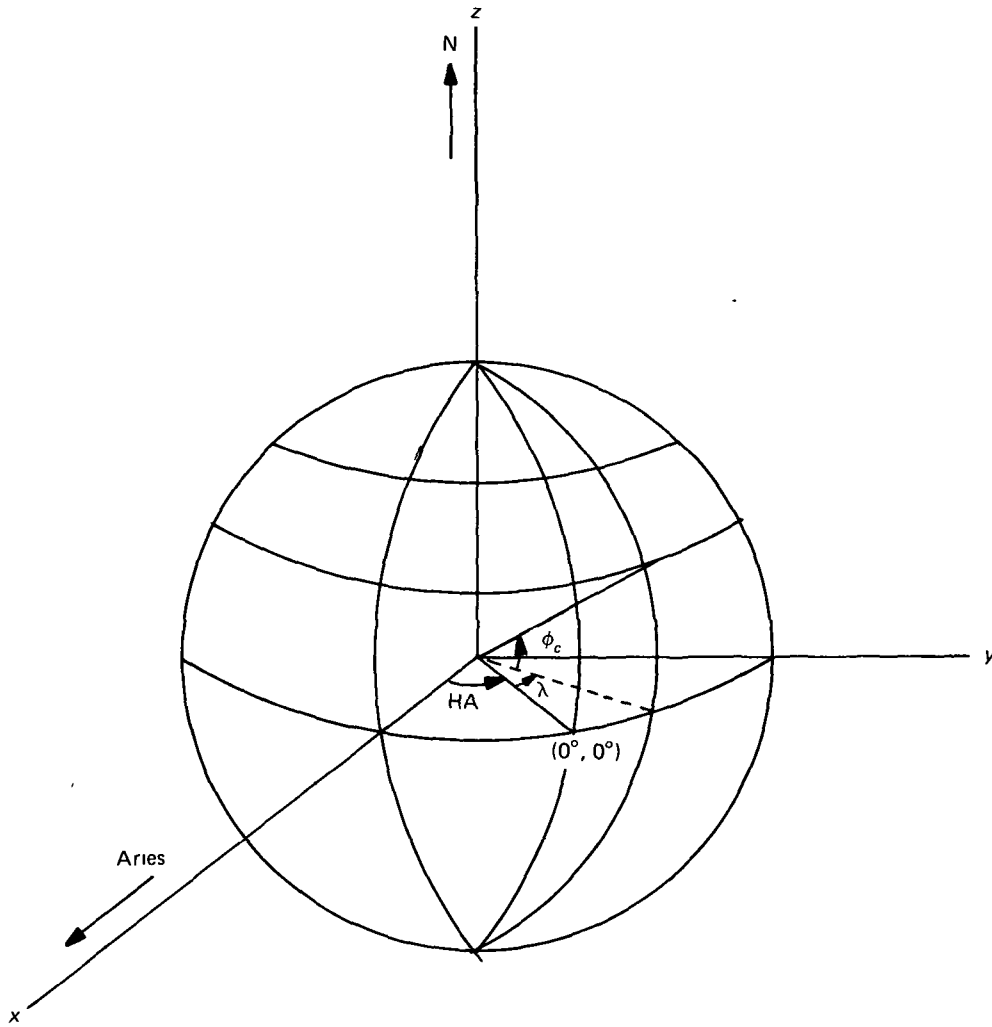


FIGURE A-3 — Inertial to geocentric coordinate transformation

Transformation from inertial to geocentric coordinate systems is a pure rotation counterclockwise about the z -axis through HA for some time t . (See fig. A-3.) Denoting the components of P in the geocentric system by P_x, P_y, P_z , we have

$$\begin{bmatrix} P_x \\ P_y \\ P_z \end{bmatrix} = T \begin{bmatrix} P'_x \\ P'_y \\ P'_z \end{bmatrix} \quad (\text{A-17})$$

where

$$T = \begin{bmatrix} \cos HA & \sin HA & 0 \\ -\sin HA & \cos HA & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad (\text{A-18})$$

GEOCENTRIC TO INERTIAL

For transformation from the geocentric coordinate system to the inertial system,

$$\begin{bmatrix} P'_x \\ P'_y \\ P'_z \end{bmatrix} = T^{-1} \begin{bmatrix} P_x \\ P_y \\ P_z \end{bmatrix} \quad (\text{A-19})$$

where

$$T^{-1} = \begin{bmatrix} \cos HA & -\sin HA & 0 \\ \sin HA & \cos HA & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad (\text{A-20})$$

INERTIAL TO TOPOCENTRIC

The topocentric coordinate system is defined as a right-handed coordinate system with origin at point $Q(R_i, \phi_c, \lambda)$. The x -axis is directed outward toward the zenith of Q , the z -axis is directed north, and the y, z plane is the plane of the local horizon of Q .

To transform from inertial to topocentric coordinates, first rotate about the z -axis through the angle $(HA + \lambda)$ for some time t . Then rotate these results about the new y -axis through the geocentric latitude ϕ_c . The origin is then translated from the Earth's center to the point Q .

Let P be the vector whose inertial components are P'_x, P'_y, P'_z , then

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = RT \begin{bmatrix} P'_x \\ P'_y \\ P'_z \end{bmatrix} \quad (\text{A-21})$$

where T is the 3×3 matrix of equation (A-18) and

$$R = \begin{bmatrix} \cos \phi_c & 0 & \sin \phi_c \\ 0 & 1 & 0 \\ -\sin \phi_c & 0 & \cos \phi_c \end{bmatrix} \quad (\text{A-22})$$

Translating from the Earth's center to Q ,

$$P_{xT} = x - R_i \quad (\text{A-23})$$

$$P_{yT} = y \quad (\text{A-24})$$

$$P_{zT} = z \quad (\text{A-25})$$

where R_i is the radial distance from the Earth's center to the point Q in ERU's.

INERTIAL TO ECLIPTIC

The ecliptic coordinate system is defined as a right-handed rectangular coordinate system with its center at the Earth's center and x -axis the angular distance from the inertial x -axis to the mean longitude of the Sun. The x, y plane lies in the plane of the ecliptic with the y -axis 90° counterclockwise from the x -axis. The z -axis completes the right-handed system. The transformation from the inertial to ecliptic reference frames is then purely rotational. (See ref. 4.) To perform this transformation, rotate counterclockwise about the inertial x -axis through the angle of inclination of the ecliptic plane to the equatorial plane E :

$$\begin{bmatrix} x_e \\ y_e \\ z_e \end{bmatrix} = A \begin{bmatrix} x_i \\ y_i \\ z_i \end{bmatrix} \quad (\text{A-26})$$

where

$$A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos E & \sin E \\ 0 & -\sin E & \cos E \end{bmatrix} \quad (\text{A-27})$$

The ecliptic latitude ϕ_e and ecliptic longitude λ_e are

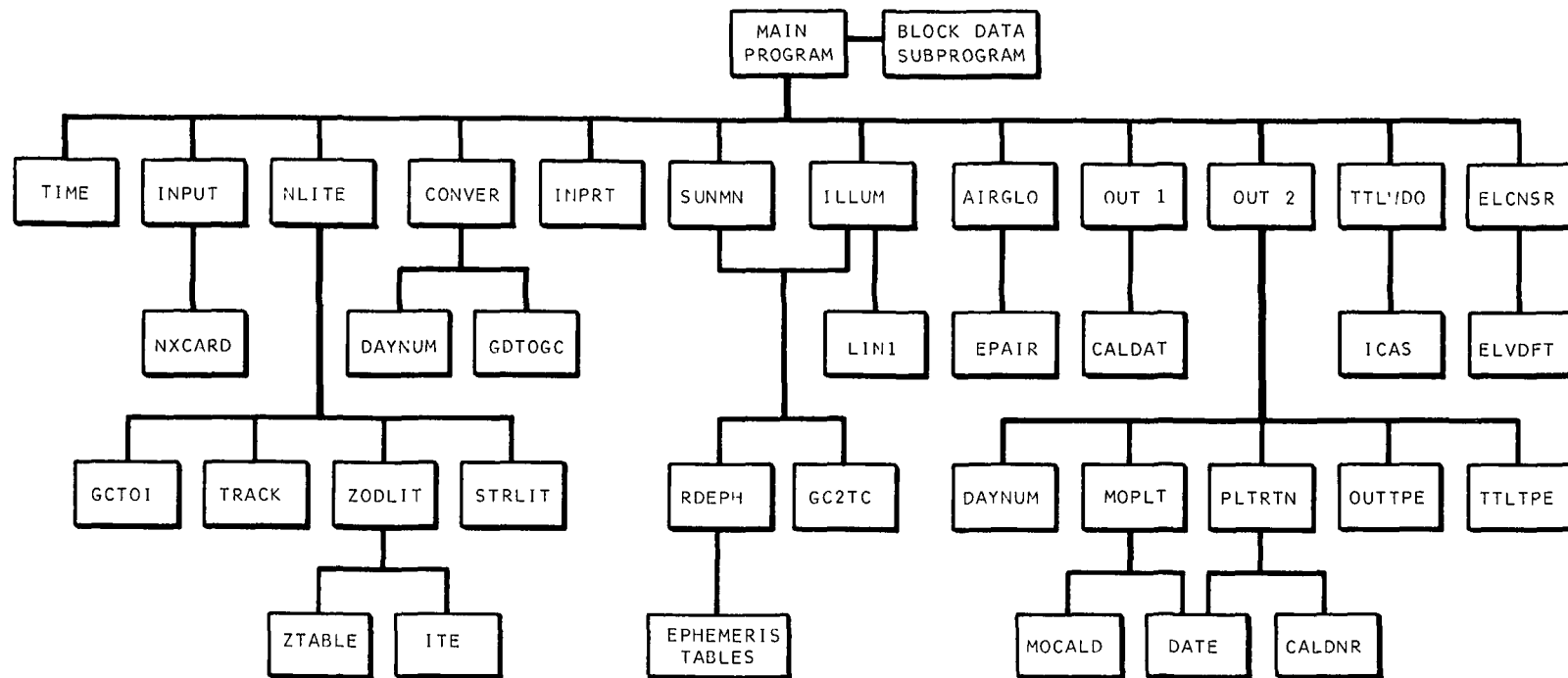
$$\phi_e = \arcsin \frac{x_e}{\sqrt{x_e^2 + y_e^2 + z_e^2}} \quad (\text{A-28})$$

$$\lambda_e = \arctan \frac{y_e}{x_e} \quad (\text{A-29})$$

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This appendix describes the programing logic used in the computer program and provides a basic understanding of the methods used to develop the defined daily release window requirements. A collection of the flowcharts, a listing of all subroutine documentation cards, and a hierarchy chart of the entire set of subroutines used in the program are included here.



PROGRAM HIERARCHY CHART

SNUMB = 68427, ACTIVITY # = 02, REPORT CODE = 06, RECORD COUNT = 03290

*****TARGET RELEASE WINDOW - PROGRAM NUMBER 1:1,1615

*****NASA Wallops Version of 02/01/70

*****LANGUAGE-FORTRAN IV

*****MACHINE-GE 625

*****PROGRAM AUTHORS-

CURTIS, C. MARSHALL
 EVERTON, EDGAR
 HARMON, THOMAS
 HANCOCK, DAVID
 MELVIN, DENNIS
 MICHAUD, NORMAN

*****PURPOSE-

THIS IS THE MAIN PROGRAM WHICH COMPUTES THE RELEASE WINDOWS FOR
 A SKY TARGET EXPERIMENT.

*****METHOD-

THIS PROGRAM PROVIDES AUTOMATIC COMPUTATION OF THE RELEASE
 WINDOWS SATISFYING THE REQUIREMENTS FOR THE RELEASE CRITERIA.
 THIS PROGRAM IS DEVELOPED IN MODULAR FORM WITH THE FOLLOWING
 MAIN FUNCTIONS.,.

A.DEFINE PROGRAM INPUTS.

B.DEFINE RE-Occurring PROGRAM CONSTANTS.

C.DEFINE TIME INTERVALS FOR WHICH THE GIVEN TRACKING STATIONS
 CLOUD RELEASE POINT AND CLOUD POSITION DURING THE TRACKING
 PERIOD ARE SATISFACTORY FOR THE INPUT VALUES OF THE FOLLOWING
 CONSTRAINTS.,.

1.THE TARGET CLOUD IS NOT WITHIN THE SHADOW OF THE EARTH AT
 RELEASE TIME OR DURING THE EXPERIMENTAL PERIOD.

2.THE RELATIVE ELEVATION LOOK ANGLE FROM EACH TRACKING
 STATION TO THE CLOUD WILL BE GREATER THAN THAT SPECIFIED IN
 INPUT,AT TIME OF RELEASE AND DURING THE EXPERIMENTAL PERIOD

3.THE RELATIVE ELEVATION ANGLE OF THE SUN FROM EACH
 TRACKING STATION IS BELOW THAT OF THE GIVEN CONSTRAINT.

4.THE RELATIVE ELEVATION ANGLE OF THE MOON FROM EACH
 TRACKING STATION IS BELOW THAT OF THE GIVEN CONSTRAINT.

5.THE SKY BACKGROUND BRIGHTNESS OF THE CLOUD DUE TO
 AIRGLOW,ZODIACAL LIGHT,AND STARLIGHT AS SEEN FROM EACH
 TRACKING STATION WILL BE LESS THAN THE INPUT REQUIREMENT.

D,PROVIDE THESE ABOVE STATED TIME INTERVALS IN OUTPUT FORMAT.

E.PROVIDE THE CAPABILITY FOR MULTIPLE CASE RUNS WITH VARYING
 RELEASE POINTS AND DRIFT RATES.

F.COMBINE THESE ABOVE STATED TIME INTERVALS ON A DAILY BASIS,
 AS TO DEFINE A DAILY TIME PERIOD FOR WHICH ALL CONSTRAINTS
 WILL BE MET FOR ALL TRACKING STATIONS SIMULTANEOUSLY.

G.CREATE A PLOT OF THESE COMBINED DAILY RELEASE WINDOWS.

THE PROGRAM HAS THE FOLLOWING OPTIONS.:

A, UP TO TWELVE FIXED TRACKING STATIONS MAY BE INPUT,

B, IF A MOVING OR AIRCRAFT TRACKING STATION IS INPUT, THEN THE MAXIMUM NUMBER OF FIXED STATIONS ALLOWED IS ELEVEN, THE POSITION OF THE MOVING STATION AT RELEASE TIME AND AT HALF HOUR INCREMENTS INTO THE EXPERIMENTAL PERIOD MUST BE INPUT,

C, A MAXIMUM OF THREE HOURS FOR THE EXPERIMENTAL PERIOD MAY BE USED IN INCREMENTS OF ONE HALF HOUR.

D, NOMINAL VALUES FOR PROGRAM CALCULATION DATE PERIOD, GENERAL PROGRAM OPTIONS, TRACKING STATIONS AND RELEASE POINT COORDINATES, AND THE VALUES FOR THE CONSTRAINTS CAN BE PRESET,

E, THE GENERAL OPTIONS FOR THE PROGRAM CONSIST OF THE FOLLOWING.:

1. PERFORM THE PROGRAM CALCULATIONS.

2. CREATE A TAPE ON FILE 11 TO STORE THE SUN AND MOON DAILY TIME INTERVALS FOR THE GIVEN TRACKING STATIONS OR USE AN EXISTING TAPE READ IN ON TAPE FILE 11 IN ORDER TO SKIP THESE CALCULATIONS,

3. CREATE A TAPE ON FILE 07 OF THE DAILY TIME INTERVALS FOUND FOR EACH CONSTRAINT AND FOR EACH STATION AND/OR PRINT AN EXISTING TAPE THROUGH FILE 07,

4. CREATE A TAPE ON FILE 09 OF THE COMBINED DAILY RELEASE WINDOWS AND/OR PRINT AN EXISTING TAPE THROUGH FILE 09.

5. CREATE A TAPE FOR PLOTTING FROM THE DATA ON TAPE FILE 09 OR NOT.

THE FORMAT OF THIS MAIN PROGRAM IS TO ...

A, READ THE INPUTS.

B, PERFORM PROGRAM CALCULATIONS TO YIELD THE PROGRAM CONSTANTS

C, CALCULATE THE PARAMETERS FOR THE CONSTRAINTS NOT DEPENDENT UPON TIME.

D, FIND THE TIME INTERVALS FOR EACH CONSTRAINT AND STORE ON A DAILY BASIS.

E, PROVIDE THE REQUESTED PRINTED OUTPUT AND/OR PLOT TAPE.

F, REPEAT A THRU E FOR MULTIPLE CASE RUNS,
IN SELECTING THE OPTION NOT TO CALCULATE THEN B, C, AND D ARE OMITTED, FOR DETAILED EXPLANATION OF ENTIRE PROGRAM FUNCTIONS SEE THE COMMENTS AVAILABLE WITH EACH SUBROUTINE.

*****SYSTEMS INPUT FILES*

FILE 05 = CARD READER

FILE 07 = IF OPTION 'ICALC' = 1 AND 'IPRT7' = 0

FILE 09 = IF OPTION 'ICALC' = 1 AND 'IPRT9' = 0

FILE 11 = IF OPTION 'IPRT11' = 1

*****SYSTEMS OUTPUT FILES-

FILE 01 = IF 'IPL01' = 0,1(NOTE TAPE FILE 01 MUST BE RECORDED AT 556 BPI)

FILE 06 = PRINTER
CONTAINS DATA FROM FILE 07 IF IPRT7 = 0
CONTAINS DATA FROM FILE 09 IF IPRT9 = 0

FILE 07 = IF 'ICALC' = 0

FILE 09 = IF 'ICALC' = 0

FILE 11 = IF 'IPRT11' = 0

*****ADDITIONAL SYSTEMS FILES-

FILE 11 = FOR MORE THAN 1 CASE WITHIN JOB RUN.

FILE 12 = FOR MORE THAN 1 CASE WITHIN JOB RUN.

FILE 13 = ALWAYS REQUIRED.

*****INPUT-

| | |
|--------|---|
| ICALC | -INTEGER CODE TO SIGNAL IF PROGRAM CALCULATIONS -ARE REQUESTED -#0; PERFORM PROGRAM CALCULATIONS -#1,DO NOT PERFORM PROGRAM CALCULATIONS |
| IPRT7 | -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07 -#0,PRINT FILE 07 DATA -#1,DO NOT PRINT FILE 07 DATA |
| IPRT9 | -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09 -DATA -#0,PRINT FILE 09 DATA -#1,DO NOT PRINT FILE 09 DATA |
| IPRT11 | -INTEGER CODE TO SIGNAL REQUEST CREATING FILE 11 -DATA -#0,DO NOT CREATE FILE 11 TAPE USE EXISTING INPUT -TAPE ON FILE 11 -#1,CREATE FILE 11 TAPE -#2,DO NOT USE FILE 11 |
| ICASE | -CASE NUMBER (INTEGER) |
| IFINAL | -INTEGER CODE TO DESIGNATE LAST INPUT CASE -#0,MORE CASES TO FOLLOW |
| IPRT7 | -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07 |
| IJJUL | -JULIAN DATE FOR CURRENT DATA |
| NDPJ0 | -NUMBER OF DAYS PAST EPOCH DATE TO DATE FOR -STARTING CALCULATIONS (INTEGER) |
| NDTE | -NUMBER OF DAYS PAST EPOCH DATE TO DATE FOR -STOPPING CALCULATIONS (INTEGER) |

DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

| | |
|---------|--|
| EPOCH | -JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS ON -FILE 09 |
| RVC | -RADIAL DISTANCE FROM EARTH CENTER TO RELEASE -POINT (ERJ) |
| DRIFT | -THE SPACE-FIXED DRIFT OF CLOUD (DEG/HR) |
| R(2) | -ELEVATION CONSTRAINT (RADIAN) |
| R(6) | -CLOUD DRIFT RATE (RADIAN/HR) |
| R(7) | -MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS) |
| NS | -THE NUMBER OF STATIONS USED IN THE PROGRAM |
| NOS(12) | -AN ARRAY CONTAINING THE STATION NUMBERS USED |
| RTH | -CONVERSION FACTOR FROM RADIAN TO HOURS |
| HTR | -CONVERSION FACTOR FROM HOURS TO RADIAN |
| SUNL | -MEAN LONGITUDE OF THE SUN AT 0 HRS,UT. |
| GHA | -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS |
| SHADOW | -UNIVERSAL TIME (HRS) -RADIUS OF EARTH SHADOW REGION (RADIAN) |
| GAMMA | -COSINE OF 'SHADOW' |

*****OUTPUT-

WINDOW(6,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES,
 -1ST INDEX FOR STORING START/STOP TIMES,
 -1,3,5 FOR START TIMES
 -2,4,6 FOR STOP TIMES
 -2ND INDEX FOR THE CONSTRAINT
 - 1=EARTH SHADOW
 - 2=ELEVATION
 - 3=SUN
 - 4=Moon
 - 5=TOTAL SKY BACKGROUND BRIGHTNESS
 -3RD INDEX FOR THE STATION NUMBER

*****RESTRICTIONS-

THOSE ALREADY NOTED UNDER METHOD, DETAILED RESTRICTIONS ON
 VARIOUS PHASES OF THE PROGRAM DEFINITION ARE NOTED IN EACH
 SUBROUTINE,

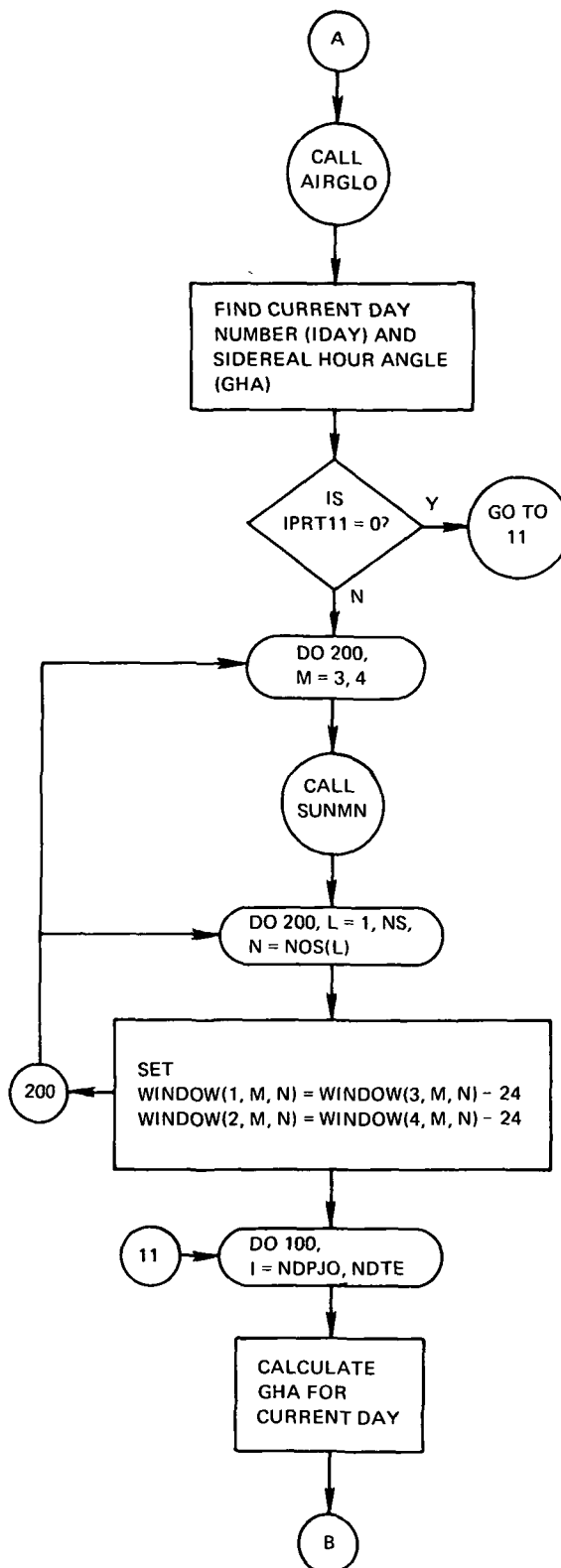
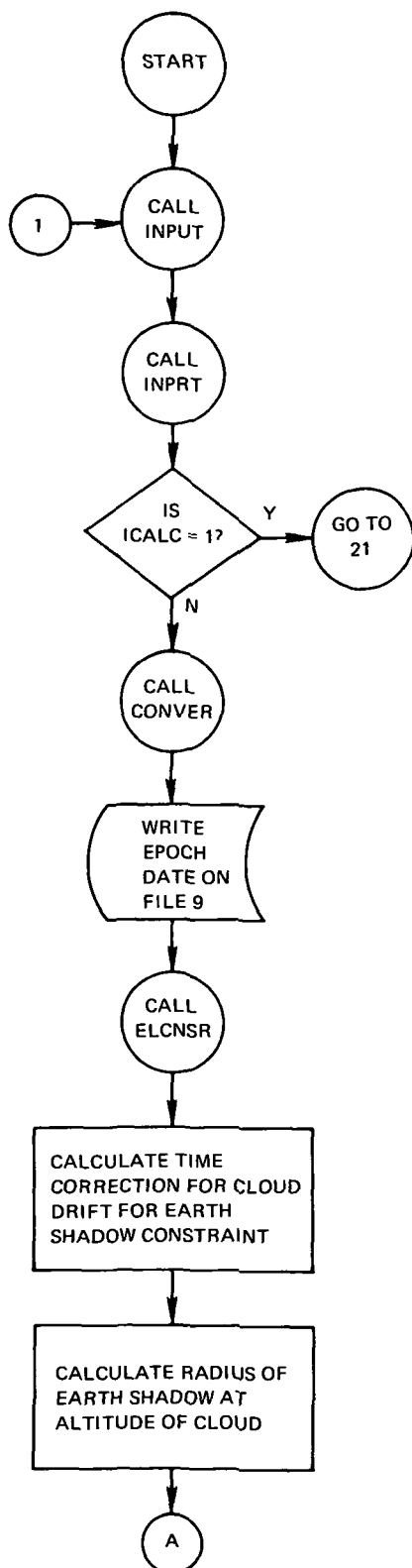
*****SUBPROGRAMS REQUIRED-

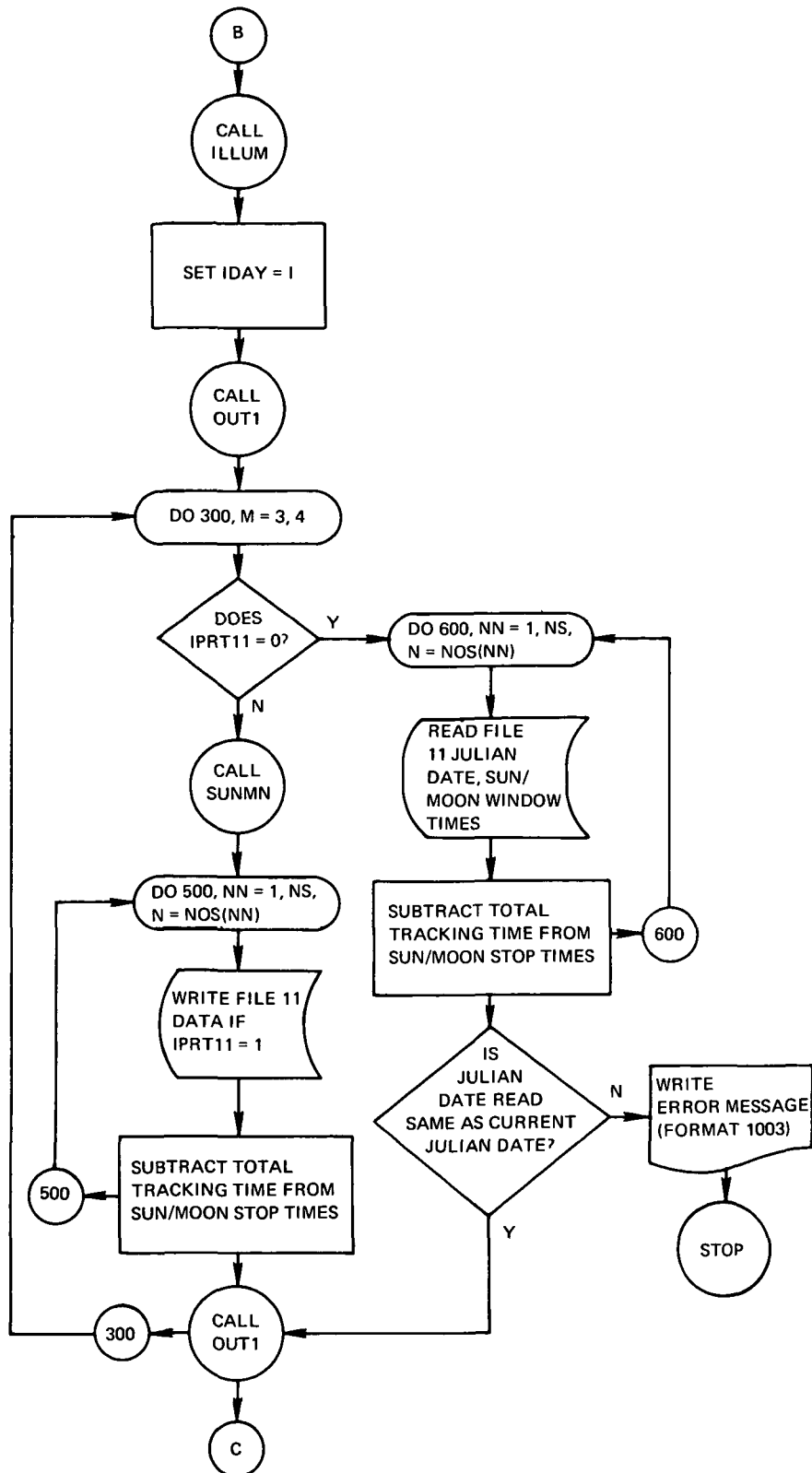
BLOCK DATA
 INPUT
 NXCARD
 INPRT
 CONVER
 DAYNUM
 GDTGCR

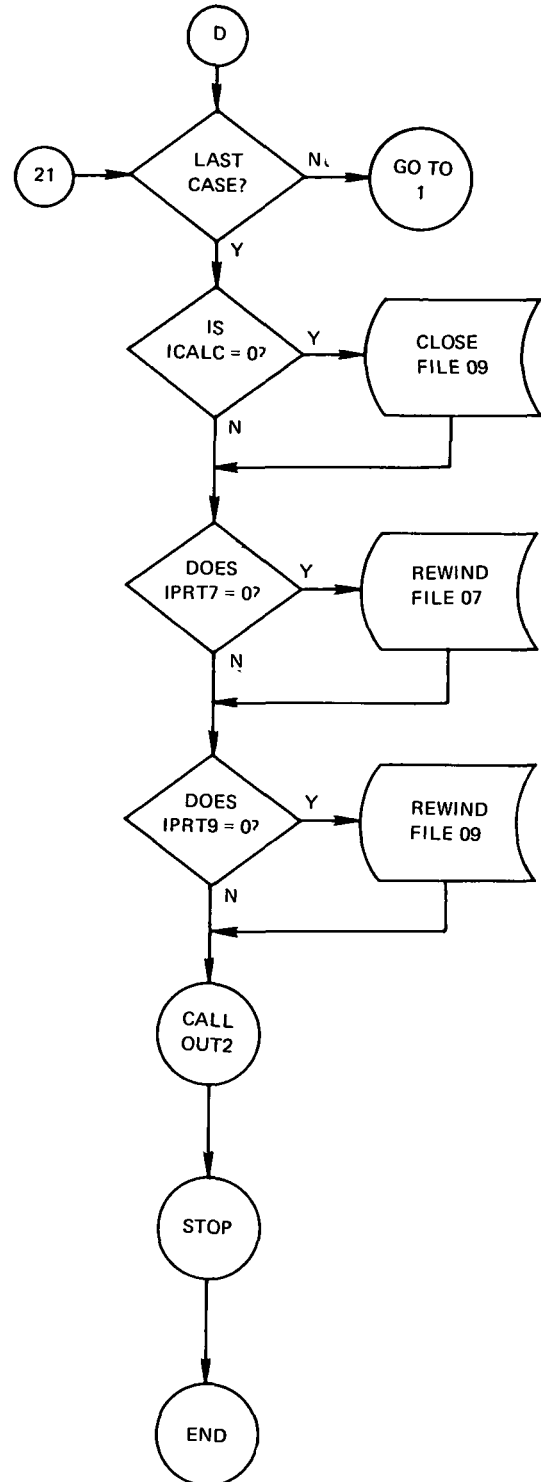
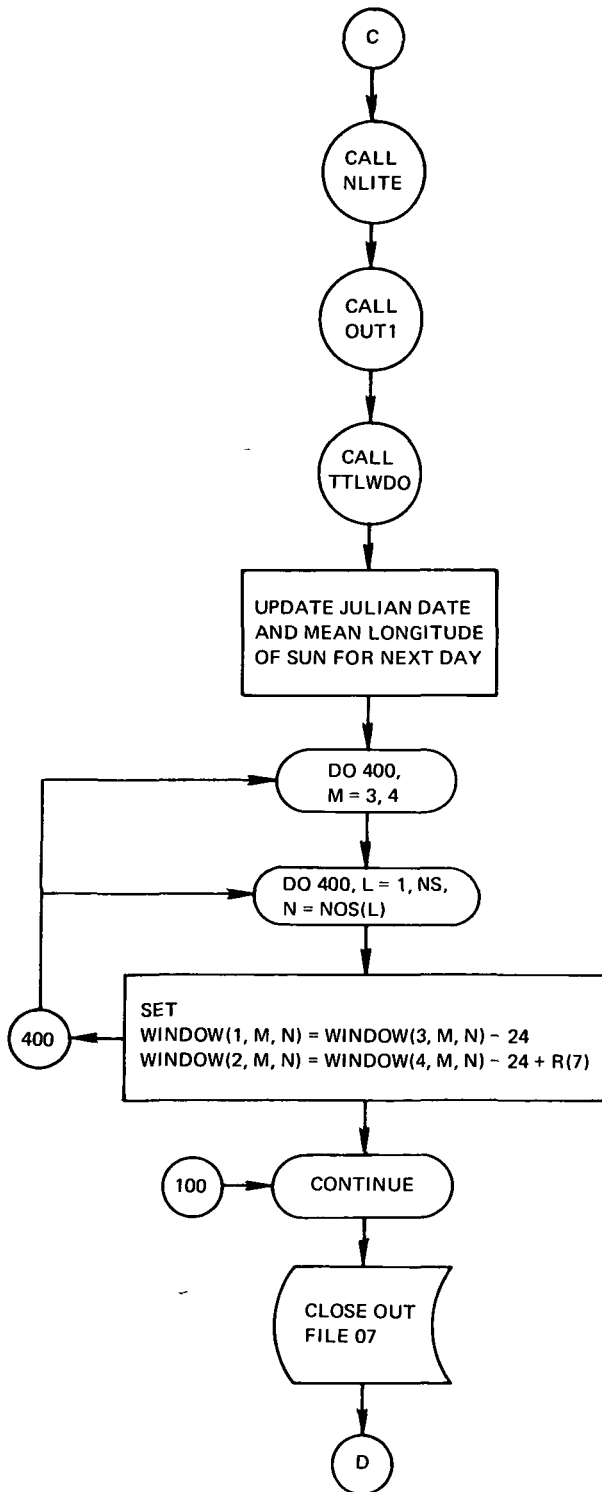
```

TIME
ELCNSR
    ELVDFT
AIRGLO
    EPAIR
SUNMN
ILLUM
    LIN1
    GC2TC
    RDEPW
        EPHERMERIS TABLES
ALITE
    GCTOI
    TRACK
    STRLIT
    ZODLIT
        ITE
        ZTABLE
OUT1
    CALDAT
TTLWDO
    ICAS
OUT2
    TTLTPE
    OUTTPE
    DAYNUM
    PLTRTN
    MOPLOT
        DATE
        CALDNR
        MOCALD
        PLOT

```







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*****BLOCK DATA SUBPROGRAM*****
*****NASA WALLOPS VERSION OF 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE=GE 625
*****PURPOSE=
      TO DEFINE NOMINAL INPUT PARAMETERS AND TO DEFINE CONVERSION
      FACTORS FOR USE IN THE BIGWINDOW PROGRAM,
*****METHOD=
      DEFINE CONSTANTS AND NOMINAL PARAMETERS THROUGH DATA STATEMENTS

*****INPUT=
      NONE

*****OUTPUT=
      KMONTH      -MONTH NUMBER FOR STARTING CALCULATIONS
      KDAY        -DAY   NUMBER FOR STARTING CALCULATIONS
      KYEAR       -YEAR  NUMBER FOR STARTING CALCULATIONS
      LMONTH      -MONTH NUMBER FOR STOPPING CALCULATIONS
      LDAY        -DAY   NUMBER FOR STOPPING CALCULATIONS
      LYEAR       -YEAR  NUMBER FOR STOPPING CALCULATIONS
      KMO         -MONTH PLOTTING AND/OR PRINTING TO BEGIN
      KDA         -DAY   PLOTTING AND/OR PRINTING TO BEGIN
      KYR         -YEAR  PLOTTING AND/OR PRINTING TO BEGIN
      LMO         -MONTH PLOTTING AND/OR PRINTING TO END
      LDA         -DAY   PLOTTING AND/OR PRINTING TO END
      LYR         -YEAR  PLOTTING AND/OR PRINTING TO END
      IALC        -INTEGER CODE TO SIGNAL IF PROGRAM CALCULATIONS
                  -ARE REQUESTED
                  -#0,   PERFORM PROGRAM CALCULATIONS
                  -#1,DO NOT PERFORM PROGRAM CALCULATIONS
      IPRT7       -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07
                  -#0,PRINT FILE 07 DATA
                  -#1,DO NOT PRINT FILE 07 DATA
      IPRT9       -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09
                  -DATA

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DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

```

      -#0; PRINT FILE 09 DATA
      -#1; DO NOT PRINT FILE 09 DATA

IPRT11      -INTEGER CODE TO SIGNAL REQUEST CREATING FILE 11
            -DATA
            -#0; CREATE FILE 11 TAPE
            -#1; DO NOT CREATE FILE 11 TAPE USE EXISTING INPUT
            -TAPE ON FILE 11
            -#2; DO NOT USE FILE 11

IPLOT      -INTEGER CODE TO SIGNAL REQUEST PLOTTING DATA
            -#0; CREATE A TAPE FOR PLOTTING DATA FOR A
            -   CALENDAR YEAR THROUGH FILE 01 AT 556 BPI
            -#1; CREATE A TAPE FOR PLOTTING DATA FOR A
            -   CALENDAR MONTH THROUGH FILE 01 AT 556 BPI
            -#2; DO NOT CREATE A PLOT TAPE

PHIPDG      -GEODETIC LATITUDE OF RELEASE POINT (DEG)

LAMPDG      -LONGITUDE OF RELEASE POINT (DEG)

HEIGHT      -ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE
            -(EQU)

RESTR(2)    -MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION
            -TO THE RELEASE POINT (DEG)

RESTR(3)    -MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH
            -TRACKING STATION (DEG)

RESTR(4)    -MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH
            -TRACKING STATION (DEG)

RESTR(5)    -MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE
            -RELEASE POINT AS SEEN FROM EACH TRACKING STATION
            -(RAYLEIGHS)

RESTR(6)    -CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD
            -AFTER RELEASE RELATIVE TO THE EARTH (KM/SEC)

RESTR(7)    -MINIMUM TRACKING PERIOD REQUIRED (HRS)

RESTR(8)    -ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE
            -RELATIVE TO THE EARTH (KM/SEC)

NS          -THE NUMBER OF STATIONS USED IN THE PROGRAM

NOS(12)     -AN ARRAY CONTAINING THE STATION NUMBERS USED

NAME(3,12)  -NAME OF TRACKING STATIONS USED

PHI(12)     -GEODETIC LATITUDE OF TRACKING STATION (DEG)

LAMBDA(12)  -LONGITUDE OF TRACKING STATION (DEG)

ALT(12)     -ALTITUDE OF TRACKING STATION ABOVE EARTH SURFACE
            -(FT)

MOVE(12)    -CODE NUMBER TO DETERMINE IF STATION COORDINATES
            -ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT
            -#0; FOR FIXED STATION
            -#1; FOR AIRCRAFT

PNAME(3,7)  -ALPHANUMERIC DESCRIPTION FOR AIRCRAFT POSITION

```

-DURING TRACKING PERIOD

PLAT(7) -GEODETIC LATITUDE OF AIRCRAFT DURING
-EXPERIMENTAL PERIOD (DEG)

PLON(7) -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD
-(DEG)

PALT(7) -ALTITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD
-(DEG)

LTR -CONVERSION FACTOR FROM DEGREES TO RADIANS

RTD -CONVERSION FACTOR FROM RADIANS TO DEGREES

HTR -CONVERSION FACTOR FROM HOURS TO RADIANS

RTH -CONVERSION FACTOR FROM RADIANS TO HOURS

AU -CONVERSION FACTOR FROM ASTRONOMICAL UNITS TO
-EARTH RADII UNITS

DELTA(3) -APPROXIMATE PERIOD OF SUN MOTION (HRS)

DELTA(4) -APPROXIMATE PERIOD OF MOON MOTION (HRS)

ERM -CONVERSION FACTOR FROM EARTH RADII UNITS TO
-KILOMETERS

HALFPI -VALUE OF 90 DEGREES IN RADIANS

WINDOW(6,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES,
-1ST INDEX FOR STORING START/STOP TIMES,
-1,3,5 FOR START TIMES
-2,4,6 FOR STOP TIMES
-2ND INDEX FOR THE CONSTRAINT
- 1=EARTH SHADOW
- 2=ELEVATION
- 3=SUN
- 4=MOON
- 5=TOTAL SKY BACKGROUND BRIGHTNESS
-3RD INDEX FOR THE STATION NUMBER

LINE -LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT
-HEADING

*****RESTRICTIONS-
NONE KNOWN

*****SUBPROGRAMS REQUIRED-
NONE

*****SUBROUTINE INPUT*****

*****NASA Wallops version of 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE-GE 625

*****PURPOSE-

TO READ INPUT PARAMETERS FROM CARD READER USING THE READING
PROCESS DEFINED THROUGH SUBROUTINE VXCARD.

*****METHOD*

THIS SUBROUTINE READS INPUT CARDS IN ANY ORDER EXCEPT FOR THE 'I' OR LAST CARD, EACH CARD IS FIRST 'LOOKED AT' USING SUBROUTINE NXCARD, COLUMN 1 OF EACH CARD CONTAINS THE CODE LETTER SIGNIFYING WHAT VARIABLES ARE CONTAINED ON THE CARD, THE CARD CODE IS CHECKED AND THE CARD IS READ INTO THE PROGRAM BY THE CORRECT FORMAT AS DETERMINED FROM THE CARD CODE, IT IS NOT NECESSARY TO DEFINE ALL INPUT PARAMETERS REQUIRED TO GENERATE PROGRAM DATA, EACH INPUT VARIABLE IS DEFINED IN THE BLOCK DATA SUBPROGRAM FOR NOMINAL VALUES, CHANGES TO ANY ONE OR MORE NOMINAL VALUE DEFINED ON ONE CARD REQUIRES THAT ALL VARIABLES SPECIFIED FOR THAT CARD MUST BE INCLUDED, OMISSION OF ANY VARIABLE FROM A CARD WILL BE INTERPRETED TO HAVE A VALUE OF ZERO AND WILL OVERRIDE THE NOMINAL VALUE STORED THROUGH THE BLOCK DATA SUBPROGRAM.

*****INPUT*

VARIABLES ARE CARD INPUTS WITH THE FOLLOWING SPECIFIC CARD AND COLUMN LOCATIONS, ALL VARIABLES SPECIFIED AS INTEGERS MUST BE RIGHT-JUSTIFIED, THOSE VARIABLES NOT SPECIFIED AS INTEGERS, HOLLERITH, OR ALPHANUMERIC ARE FLOATING POINT AND MUST BE READ IN THE UNITS NOTED,

A CARD - START/STOP DATE

| | | |
|-------|------------------|-------------|
| 01 | = A | (HOLLERITH) |
| 03=04 | = STARTING MONTH | (INTEGER) |
| 06=07 | = STARTING DAY | (INTEGER) |
| 09=12 | = STARTING YEAR | (INTEGER) |
| 14=15 | = FINAL MONTH | (INTEGER) |
| 17=18 | = FINAL DAY | (INTEGER) |
| 20=23 | = FINAL YEAR | (INTEGER) |

B CARD - START/STOP DATE FOR OUTPUT

| | | |
|-------|------------------|-------------|
| 01 | = B | (HOLLERITH) |
| 03=04 | = STARTING MONTH | (INTEGER) |
| 06=07 | = STARTING DAY | (INTEGER) |
| 09=12 | = STARTING YEAR | (INTEGER) |
| 14=15 | = FINAL MONTH | (INTEGER) |
| 17=18 | = FINAL DAY | (INTEGER) |
| 20=23 | = FINAL YEAR | (INTEGER) |

C CARD - PROGRAM OPTIONS

| | | |
|----|---------------------------|--|
| 01 | = C | (HOLLERITH) |
| 04 | PROGRAM CALCULATION | |
| | = 0 | DO CALCULATIONS FOR DATES SHOWN |
| | = 1 | SKIP CALCULATIONS-ONLY PRINT FILES 01,07,09 |
| 06 | PRINT FILE 07 | |
| | = 0 | PRINT FILE 07 |
| | = 1 | DO NOT PRINT FILE 07 |
| 08 | PRINT FILE 09 | |
| | = 0 | PRINT FILE 09 |
| | = 1 | DO NOT PRINT FILE 09 |
| 10 | SUN AND MOON CALCULATIONS | |
| | = 0 | USE FILE 11 FOR WINDOW TIMES FOR SUN AND MOON |
| | = 1 | CREATE FILE 11 ON SUN AND MOON TIMES |
| | = 2 | DO NOT USE FILE 11 |
| 12 | CALCOMP PLOTTER OPTION | |
| | = 0 | GENERATE CALCOMP PLOT DATA ON FILE 01 FOR A CALENDAR YEAR |
| | = 1 | GENERATE CALCOMP PLOT DATA ON FILE 01 FOR A CALENDAR MONTH |
| | = 2 | DO NOT GENERATE CALCOMP OUTPUT |

D CARD - LOCATION OF RELEASE POINT

01 # D (HOLLERITH)
 06=15 # GEODETIC LATITUDE OF RELEASE POINT (DEG)
 16=25 # LONGITUDE OF RELEASE POINT (DEG)
 26=35 # ALTITUDE ABOVE THE EARTH'S SURFACE (FEET)

E CARD - BRIGHTNESS AND ELEVATION CONSTRAINTS

01 # E (HOLLERITH)
 06=10 # MINIMUM ELEVATION OF RELEASE POINT (DEG)
 11=15 # DEPRESSION ANGLE OF THE SUN (DEG)
 16=20 # DEPRESSION ANGLE OF THE MOON (DEG)
 21=25 # TOTAL SKY BACKGROUND BRIGHTNESS (RAYLEIGHS)
 26=30 # DRIFT RATE OF CLOUD (KM/SEC)
 31=35 # TOTAL TRACKING TIME (HRS)
 36=40 # 1/2 CLOUD'S GROWTH RATE (KM/SEC)

F CARD - STATIONS TO BE COMBINED

01 # F (HOLLERITH)
 03=04 # THE NUMBER OF STATIONS TO COMBINE
 06=07 # THE NUMBER OF THE FIRST STATION

G CARD - TRACKING SITE POSITIONAL DATA

01 # G (HOLLERITH)
 03=04 # THE CODE NUMBER OF THIS STATION (INTEGER, 12)
 05=06 # CODE FOR FIXED OR AIRCRAFT TRACKING STATION (INT,)
 # 0, STATION IS FIXED
 # 1, STATION IS AIRCRAFT
 08=25 # THE NAME OF THE TRACKING SITE (ALPHANUMERIC)
 26=35 # GEODETIC LATITUDE (DEG)
 36=45 # LONGITUDE (DEG)
 46=55 # ALTITUDE (FEET)

H CARD - POSITIONS OF AIRCRAFT DURING EXPERIMENTAL PERIOD

01 # H (HOLLERITH)
 03=04 # THE NUMBER OF THE AIRCRAFT STATION (INTEGER)
 05=06 # INDEX NUMBER FOR AIRCRAFT POSITION DURING
 THE EXPERIMENTAL PERIOD. THE AIRCRAFT POSITION
 MUST BE IN HALF HOUR INCREMENTS WITH THE FIRST
 INDEX #2 FOR THE POSITION AT .5 HRS. AFTER
 RELEASE (INTEGER)
 08=25 # THE NAME OF THE TRACKING SITE (ALPHANUMERIC)
 26=35 # GEODETIC LATITUDE (DEG)
 36=45 # LONGITUDE (DEG)
 46=55 # ALTITUDE (FT)

I CARD - FINAL CARD TO SPECIFY END OF CASE

01 # I (HOLLERITH)
 02=05 # CASE NUMBER (INTEGER)
 06=07 # CODE FOR FINAL INPUT CASE
 # 0, MORE CASES TO FOLLOW
 # 1, THIS IS THE FINAL CASE

*****OUTPUT-

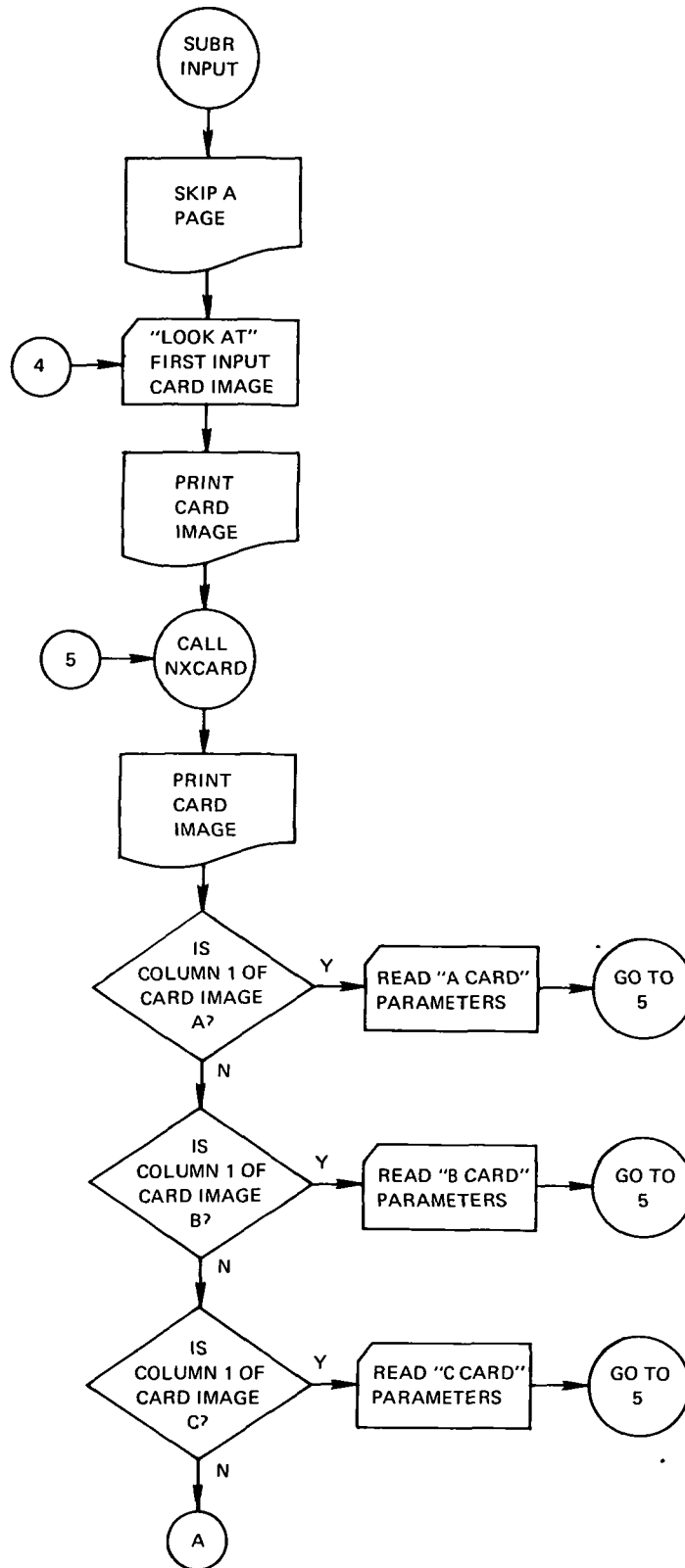
NONE

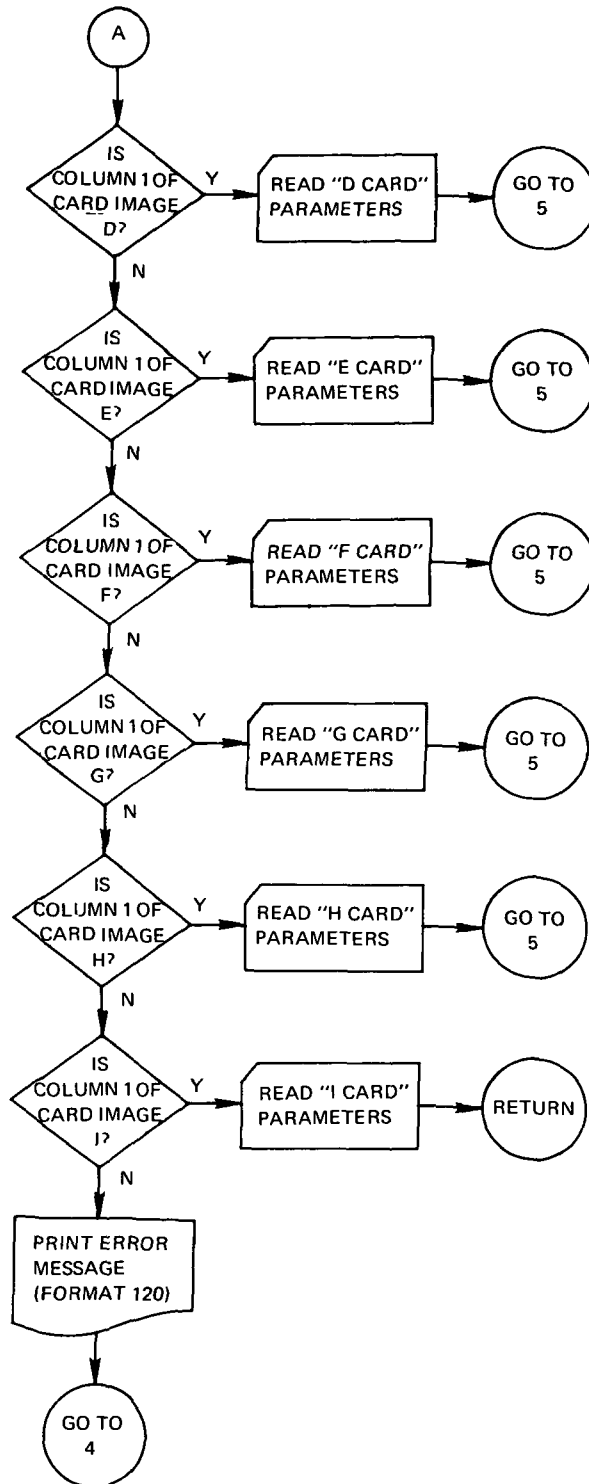
*****RESTRICTIONS=

A BLANK CARD OR DUMMY TITLE MUST PRECEDE ANY INPUT DATA FOR EACH CASE. THE 'I' CARD MUST ALWAYS BE THE LAST CARD OF EACH CASE. A PROGRAM EXECUTE USING ALL NOMINAL VALUES MUST HAVE AT LEAST THE BLANK CARD AND THE 'I' CARD FOR INPUT.

*****SUBPROGRAMS REQUIRED-

NXCARD





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*****SUBROUTINE INPT*****
*****NASA WOLLOPS VERSION OF 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE-GE 625
*****PURPOSE-
      TO WRITE ALL PROGRAM INPUTS IN A FORMAT WHICH COMPLETELY
      DESCRIBES THE INPUT PARAMETERS TO BE USED IN THE PROGRAM
      EXECUTION,
*****METHOD-
      ALL VARIABLES SPECIFIED IN SUBROUTINE INPUT ARE PRINTED IN A
      MANNER TO DESCRIBE FULLY TO THE PROGRAM USER THE INPUTS USED TO
      GENERATE PROGRAM OUTPUTS, THE FORMAT GENERATOR ROUTINE IS USED
      IN LIEU OF CUMBERSOME NORMAL FORMAT STATEMENTS FOR PRINT
      FORMATS.
*****INPUT-
      KMONTH      -MONTH NUMBER FOR STARTING CALCULATIONS
      KDAY        -DAY   NUMBER FOR STARTING CALCULATIONS
      KYEAR       -YEAR  NUMBER FOR STARTING CALCULATIONS
      LMONTH      -MONTH NUMBER FOR STOPPING CALCULATIONS
      LDAY        -DAY   NUMBER FOR STOPPING CALCULATIONS
      LYEAR       -YEAR  NUMBER FOR STOPPING CALCULATIONS
      KMO         -MONTH PLOTTING AND/OR PRINTING TO BEGIN
      KDA         -DAY   PLOTTING AND/OR PRINTING TO BEGIN
      KYR         -YEAR  PLOTTING AND/OR PRINTING TO BEGIN
      LMO         -MONTH PLOTTING AND/OR PRINTING TO END
      LDA         -DAY   PLOTTING AND/OR PRINTING TO END
      LYR         -YEAR  PLOTTING AND/OR PRINTING TO END
      IALC        -INTEGER CODE TO SIGNAL IF PROGRAM CALCULATIONS
                  -ARE REQUESTED
                  -#0; PERFORM PROGRAM CALCULATIONS
                  -#1;DO NOT PERFORM PROGRAM CALCULATIONS
      IPRT7       -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07
                  -DATA
                  -#0;PRINT FILE 07 DATA
                  -#1;DO NOT PRINT FILE 07 DATA
      IPRT9       -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09
                  -DATA
                  -#0;PRINT FILE 09 DATA
                  -#1;DO NOT PRINT FILE 09 DATA
      IPLOT       -INTEGER CODE TO SIGNAL REQUEST PLOTTING DATA
                  -#0; CREATE A TAPE FOR PLOTTING DATA FOR A
                  -   CALENDAR YEAR THROUGH FILE 01 AT 556 BPI

```

*#1, CREATE A TAPE FOR PLOTTING DATA FOR A
 * CALENDAR MONTH THROUGH FILE 01 AT 556 BPI
 *#2, DO NOT CREATE A PLOT TAPE

ICASE *INTEGER VALUE OF CASE NUMBER

IFINAL *INTEGER CODE NOTING LAST CASE
 *#0, MORE CASES TO FOLLOW
 *#1, THIS IS THE FINAL CASE

PHIPDG *GEODETIC LATITUDE OF RELEASE POINT (DEG)

LAMPDG *LONGITUDE OF RELEASE POINT (DEG)

HEIGHT *ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE
 *(FT)

RESTR(2) *MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION
 *TO THE RELEASE POINT (DEG)

RESTR(3) *MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH
 *TRACKING STATION (DEG)

RESTR(4) *MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH
 *TRACKING STATION (DEG)

RESTR(5) *MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE
 *RELEASE POINT AS SEEN FROM EACH TRACKING STATION
 *(RAYLEIGHS)

RESTR(6) *CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD
 *AFTER RELEASE RELATIVE TO THE EARTH (KM/SEC)

RESTR(7) *MINIMUM TRACKING PERIOD REQUIRED (HRS)

RESTR(8) *ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE
 *RELATIVE TO THE EARTH (KM/SEC)

NS *THE NUMBER OF STATIONS USED IN THE PROGRAM

NOS(12) *AN ARRAY CONTAINING THE STATION NUMBERS USED

NAME(3,12) *NAME OF TRACKING STATIONS USED

PHI(12) *GEODETIC LATITUDE OF TRACKING STATION (DEG)

LAMBDA(12) *LONGITUDE OF TRACKING STATION (DEG)

ALT(12) *ALTITUDE OF TRACKING STATION ABOVE EARTH SURFACE
 *(FT)

MOVE(12) *CODE NUMBER TO DETERMINE IF STATION COORDINATES
 *ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT
 *#0, FOR FIXED STATION
 *#1, FOR AIRCRAFT

PNAME(3,7) *ALPHANUMERIC DESCRIPTION FOR AIRCRAFT POSITION
 *DURING EXPERIMENTAL PERIOD

PLAT(7) *GEODETIC LATITUDE OF AIRCRAFT DURING
 *EXPERIMENTAL PERIOD (DEG)

PLON(7) *LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD
 *(DEG)

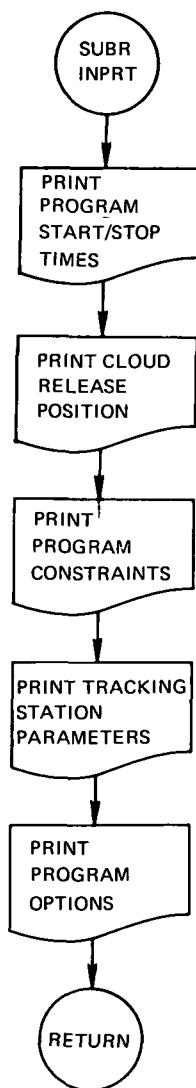
DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

PALT(7) ALTITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD
 (DEG)

*****OUTPUT*
ON FILE 06-PRINTER
ALL VARIABLES LISTED ABOVE ARE USED FOR OUTPUT

*****RESTRICTIONS*
FORMAT GENERATOR IS A GE-625 SYSTEMS ROUTINE, USE OF THIS
SUBROUTINE ON ANOTHER SYSTEM MAY REQUIRE THAT THESE FORMAT
GENERATORS BE CHANGED;

*****SUBPROGRAMS REQUIRED*
NONE



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*****SUBROUTINE CONVER*****
*****NASA WOLLOPS VERSION OF 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE=GE 625
*****PURPOSE-
*****SUBROUTINE CONVER*****
      TO CONVERT STATION AND CLOUD PARAMETERS TO NECESSARY RECURRING
      VARIABLES USED IN THE ENTIRE PROGRAM
*****METHOD-
      GIVEN THE GEODETIC COORDINATES OF THE RELEASE POINT AND OF THE
      STATIONS, CONVERT TO GEOCENTRIC, ALSO CALCULATE THE FOLLOWING

      A. THE RADIUS VECTORS FOR THE RELEASE POINT AND STATIONS IN ERU
      B. THE SINES AND COSINES OF THE GEOCENTRIC COORDINATES
      C. THE GEOCENTRIC X, Y, Z COMPONENTS IN ERU
      D. THE RESTRICTIONS IN DEGREES TO RADIANS
      E. THE SPACE FIXED DRIFT OF THE CLOUD IN RADIANS/HOUR
      F. THE NECESSARY DATES REFERENCED TO AN EPOCH DATE OF JANUARY 0
      OF THE YEAR REQUESTED TO BEGIN CALCULATIONS;
      G. THE MEAN LONGITUDE OF THE SUN FOR THE FIRST DAY TO BE
      CALCULATED.
      H. THE SPACE FIXED DRIFT OF THE CLOUD IN RADIANS/HOUR
      I. THE NECESSARY DATES REFERENCED TO AN EPOCH DATE OF JANUARY 0
      OF THE YEAR REQUESTED TO BEGIN CALCULATIONS;
      J. THE MEAN LONGITUDE OF THE SUN FOR THE FIRST DAY TO BE
      CALCULATED.
      K. ROUGH ESTIMATE OF THE SUN AND MOON TIME INTERVALS FOR THE
      FIRST DAY FOR EACH STATION.
*****INPUT-
      LMONTH      -MONTH NUMBER FOR STOPPING CALCULATIONS
      LDAY        -DAY   NUMBER FOR STOPPING CALCULATIONS
      LYEAR       -YEAR  NUMBER FOR STOPPING CALCULATIONS
      KMONTH      -MONTH NUMBER FOR STARTING CALCULATIONS
      KDAY        -DAY   NUMBER FOR STARTING CALCULATIONS
      KYEAR       -YEAR  NUMBER FOR STARTING CALCULATIONS
      PHIPDG      -GEODETIC LATITUDE OF RELEASE POINT (DEG)
      LAMPDG      -LONGITUDE OF RELEASE POINT (DEG)
      HEIGHT      -ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE
                  -(ERU)
      RESTR(2)     -MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION
                  -TO THE RELEASE POINT (DEG)
      RESTR(3)     -MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH
                  -TRACKING STATION (DEG)

```

DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

RESTR(4) -MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH
 -TRACKING STATION (DEG)
 RESTR(5) -MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE
 -RELEASE POINT AS SEEN FROM EACH TRACKING STATION
 -(RAYLEIGHS)
 RESTR(6) -CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD
 -AFTER RELEASE RELATIVE TO THE EARTH (KM/SEC)
 RESTR(7) -MINIMUM TRACKING PERIOD REQUIRED (HRS)
 RESTR(8) -ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE
 -RELATIVE TO THE EARTH (KM/SEC)
 NS -THE NUMBER OF STATION USED IN THE PROGRAM
 NOS(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED
 PHI(12) -GEODEIC LATITUDE OF TRACKING STATION (DEG)
 LAMBDA(12) -LONGITUDE OF TRACKING STATION (DEG)
 ALT(12) -ALTITUDE OF TRACKING STATION ABOVE EARTH SURFACE
 -(FT)
 MOVE(12) -CODE NUMBER TO DETERMINE IF STATION COORDINATES
 -ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT
 -0, FOR FIXED STATION
 -1, FOR AIRCRAFT
 PNAME(3,7) -ALPHANUMERIC DESCRIPTION FOR AIRCRAFT POSITION
 -DURING EXPERIMENTAL PERIOD
 PLAT(7) -GEODEIC LATITUDE OF AIRCRAFT DURING
 -EXPERIMENTAL PERIOD (DEG)
 PLON(7) -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD
 PALT(7) -ALTITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD
 -(DEG)
 DTR -CONVERSION FACTOR FROM DEGREES TO RADIAN
 RTH -CONVERSION FACTOR FROM RADIAN TO HOURS
 ERM -CONVERSION FACTOR FROM EARTH RADIUS UNITS TO
 -KILOMETERS

*****OUTPUT-

DJUL -JULIAN DATE FOR CURRENT DATA
 NDPJD -NUMBER OF DAYS PAST EPOCH DATE TO DATE FOR
 -STARTING CALCULATIONS (INTEGER)
 NDTE -NUMBER OF DAYS PAST EPOCH DATE TO DATE FOR
 -STOPPING CALCULATIONS (INTEGER)
 EPOCH -JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS
 SINCLT -SINE OF RELEASE POINT'S GEODESIC LATITUDE

| | |
|------------|---|
| COSCLT | -COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE |
| SINCLN | -SINE OF RELEASE POINT'S LONGITUDE |
| COSCLN | -COSINE OF RELEASE POINT'S LONGITUDE |
| RVC | -RADIAL DISTANCE FROM EARTH CENTER TO RELEASE POINT (ERJ) |
| CGCX | -GEOCENTRIC X COMPONENT OF RELEASE POINT (ERU) |
| CGCY | -GEOCENTRIC Y COMPONENT OF RELEASE POINT (ERU) |
| CGCZ | -GEOCENTRIC Z COMPONENT OF RELEASE POINT (ERU) |
| PHIP | -GEOCENTRIC LATITUDE OF RELEASE POINT (RADIAN) |
| RLAMDA | -LONGITUDE OF RELEASE POINT (RADIAN) |
| R(2) | -ELEVATION CONSTRAINT (RADIAN) |
| R(3) | -SUN ELEVATION CONSTRAINT (RADIAN) |
| R(4) | -MOON ELEVATION CONSTRAINT (RADIAN) |
| R(5) | -INPUT VALUE FOR TOTAL SKY BACKGROUND BRIGHTNESS (RAYLEIGH) |
| R(6) | -CLOUD DRIFT RATE (RADIAN/HR) |
| R(7) | -MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS) |
| R(8) | -ONE-HALF OF CLOUD GROWTH RATE (RADIAN/HR) |
| SINSLT(12) | -SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE |
| COSSLT(12) | -COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE |
| SINSLN(12) | -SINE OF TRACKING STATION'S LONGITUDE |
| COSSLN(12) | -COSINE OF TRACKING STATION'S LONGITUDE |
| RVS(12) | -RADIUS VECTOR FROM EARTH CENTER TO TRACKING STATION (ERU) |
| SGCX(12) | -GEOCENTRIC X COMPONENT OF TRACKING STATION (ERU) |
| SGCY(12) | -GEOCENTRIC Y COMPONENT OF TRACKING STATION (ERU) |
| SGCZ(12) | -GEOCENTRIC Z COMPONENT OF TRACKING STATION (ERU) |
| RPHI(12) | -GEOCENTRIC LATITUDE OF TRACKING STATION (RADIAN) |
| RLAMD(12) | -LONGITUDE OF THE TRACKING STATION (RADIAN) |
| SINLAT(7) | -SINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING EXPERIMENTAL PERIOD |
| COSLAT(7) | -COSINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING EXPERIMENTAL PERIOD |
| SINLON(7) | -SINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL PERIOD |

DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

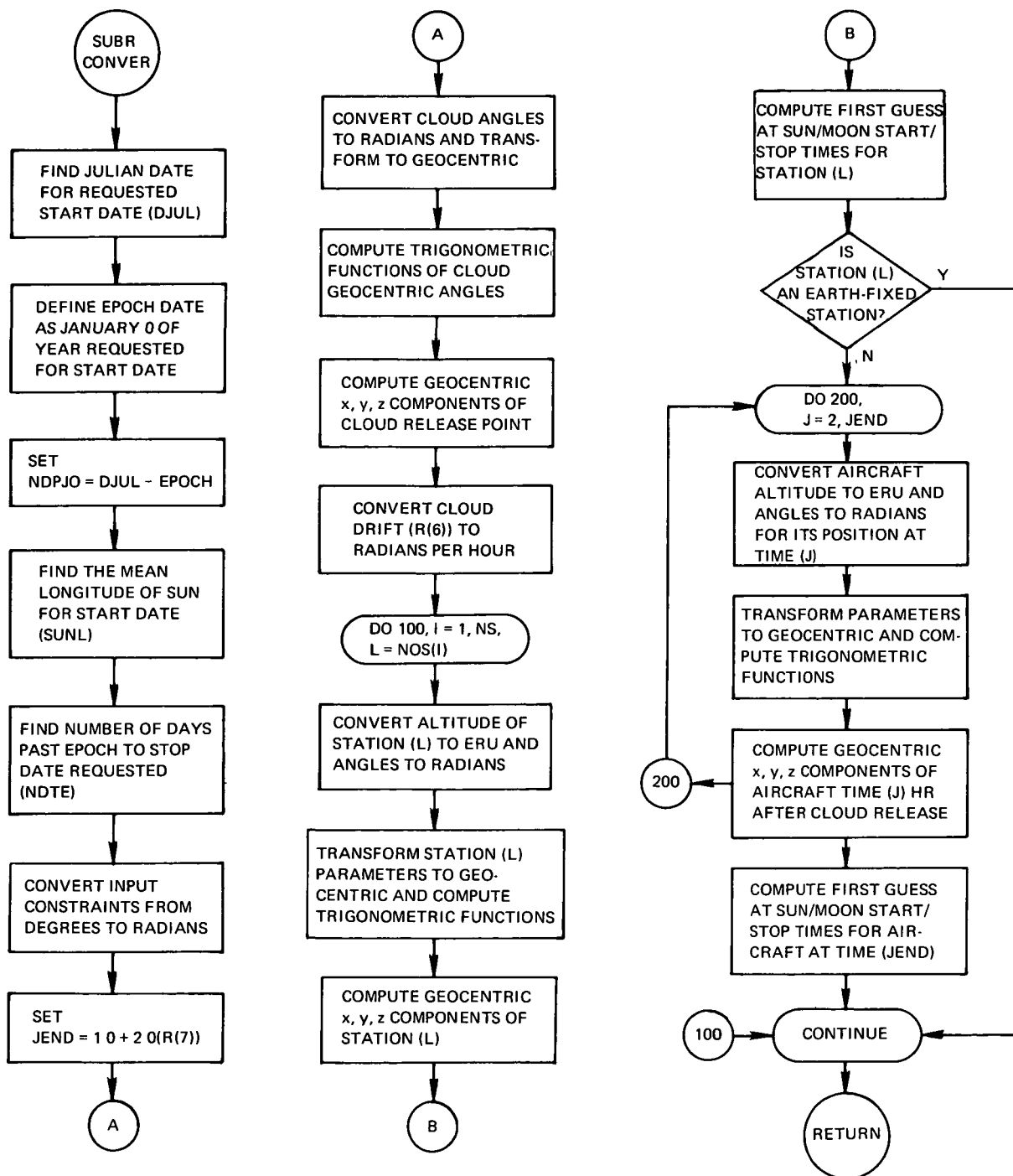
COSLON(7) -COSINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL
 -PERIOD
 RVA(7) -DISTANCE FROM EARTH CENTER TO AIRCRAFT DURING
 -EXPERIMENTAL PERIOD (ERU)
 AGCX(7) -GEOCENTRIC X COMPONENT OF AIRCRAFT POSITION
 -DURING EXPERIMENTAL PERIOD (ERU)
 AGCY(7) -GEOCENTRIC Y COMPONENT OF AIRCRAFT POSITION
 -DURING EXPERIMENTAL PERIOD (ERU)
 AGCZ(7) -GEOCENTRIC Z COMPONENT OF AIRCRAFT POSITION
 -DURING EXPERIMENTAL PERIOD (ERU)
 RLAT(7) -GEOCENTRIC LATITUDE OF AIRCRAFT DURING
 -EXPERIMENTAL PERIOD (RADIAN)S
 RLON(7) -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD
 - (RADIAN)S
 SUNL -MEAN LONGITUDE OF THE SUN AT 0 HRS,UT. FOR 1ST
 -DAY (DEG)
 WINDOW(6,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES,
 -1ST INDEX FOR STORING START/STOP TIMES,
 -1,3,5 FOR START TIMES
 -2,4,6 FOR STOP TIMES
 -2ND INDEX FOR THE CONSTRAINT
 - 1=EARTH SHADOW
 - 2=ELEVATION
 - 3=SU4
 - 4=MOON
 - 5=TOTAL SKY BACKGROUND BRIGHTNESS
 -3RD INDEX FOR THE STATION NUMBER
 JEND -NUMBER OF DISCRETE VALUES STORED FOR
 -EXPERIMENTAL PERIOD DATA

*****RESTRICTIONS*

THE ESTIMATED TIME PERIODS CALCULATED FOR THE SUN AND MOON ARE
 FOR APPROXIMATE TIMES FOR THE OCCURENCE OF ASTRONOMICAL
 TWILIGHT AND FOR THE MOON TO BE AT THE TRACKING STATION'S LOCAL
 HORIZON, ANY OTHER RELATIVE ELEVATION ANGLE OF THESE TWO
 HEAVENLY BODIES TO EACH TRACKING STATION WHICH IS QUITE
 DIFFERENT WILL REQUIRE A PROGRAM CHANGE, THE COEFFICIENTS 19.0
 AND 5.0 ARE THE APPROXIMATE TIMES FOR ASTRONOMICAL TWILIGHT AND
 THE COEFFICIENTS 11.5 AND 0.0 ARE THE APPROXIMATE COEFFICIENTS
 FOR MOONSET AND MOONRISE, BOTH ARE FOR A POINT OF 0 DEGREES
 LATITUDE AND 0 DEGREES LONGITUDE,
 THE GEODETIC EARTH MODEL USED IS THE FISCHER EARTH MODEL WITH
 AN AVERAGE EARTH RADIUS OF 6371.024 KILOMETERS,

*****SUBPROGRAMS REQUIRED*

GDTGCG



*****SUBROUTINE GDTQGC*****

*****NASA Wallops Version of 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE-GE 625

*****PURPOSE-

TO CONVERT GEODETIC COORDINATES TO GEOCENTRIC COORDINATES

*****METHOD OF ATTACK-

GIVEN THE GEODETIC LATITUDE AND ALTITUDE OF A POINT ABOVE THE EARTH'S SURFACE, USE THE DIRECT METHOD OF EVERTON TO FIND THE GEOCENTRIC LATITUDE AND RADIUS VECTOR FROM EARTH CENTER USING AN EARTH MODEL WHOSE SEMI-MAJOR AXIS IS 6378,166 KM AND WHOSE FLATTENING IS 1/298.30

*****REQUIRED INPUT-

ALT = ALTITUDE ABOVE EARTH'S SURFACE (ERU)

GLAT = GEODETIC LATITUDE (RADIAN)

*****OUTPUT GENERATED-

R = RADIUS VECTOR FROM EARTH CENTER (ERU)

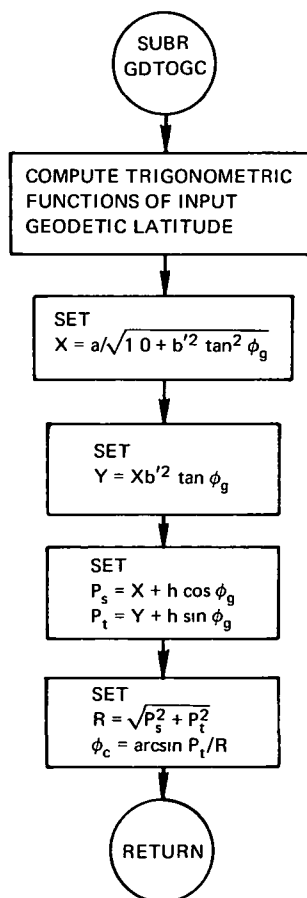
PLAT = GEOCENTRIC LATITUDE (RADIAN)

*****RESTRICTIONS-

NONE KNOWN

*****SUBPROGRAMS REQUIRED-

NONE



*****SUBROUTINE ELCNSR*****

*****NASA WALLOPS VERSION OF 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

***** PURPOSE-

TO DETERMINE IF THE TARGET CLOUD WILL BE VIEWED AT AN
ELEVATION ANGLE GREATER THAN THE GIVEN CONSTRAINT (R(3)) DURING
THE ENTIRE EXPERIMENTAL PERIOD,

*****METHOD-

FROM EACH TRACKING STATION, A REGION CAN BE DEFINED WITHIN WHICH
ALL POINTS AT ALTITUDE OF THE TARGET CLOUD CAN BE VIEWED AT AN
ELEVATION ANGLE GREATER THAN THE GIVEN CONSTRAINT; THE ARC
RADIUS OF THIS REGION WITH CENTER AT THE TRACKING STATION IS
FOUND, THE PROJECTION POINT OF THE TRACKING STATION AND OF THE
CLOUD IS USED, THE ARC DISTANCE FROM THESE PROJECTED POINTS IS
THEN CALCULATED AND IF THIS ARC DISTANCE IS LESS THAN THE ARC
RADIUS OF THE DEFINED REGION THEN THE CONSTRAINT IS MET FOR
TIME OF RELEASE; SUBROUTINE ELVDFT IS THEN USED TO DETERMINE IF
THIS GIVEN CONSTRAINT WILL BE MET FOR THE EXPERIMENTAL PERIOD,

*****INPUT-

| | |
|------------|--|
| NS | =THE NUMBER OF STATIONS USED IN THE PROGRAM |
| NOS(12) | =AN ARRAY CONTAINING THE STATION NUMBERS USED |
| RVC | =RADIAL DISTANCE FROM EARTH CENTER TO RELEASE =POINT (ERU) |
| SINCLT | =SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE |
| COSCLT | =COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE |
| SINCLN | =SINE OF RELEASE POINT'S LONGITUDE |
| COSCLN | =COSINE OF RELEASE POINT'S LONGITUDE |
| NAME(3,12) | =NAME OF TRACKING STATIONS USED |
| RVS(12) | =RADIUS VECTOR FROM EARTH CENTER TO TRACKING =STATION (ERU) |
| SINSLT(12) | =SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE |
| COSSLT(12) | =COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE |
| SINSLN(12) | = SINE OF TRACKING STATION'S LONGITUDE |
| COSSLN(12) | =COSINE OF TRACKING STATION'S LONGITUDE |
| R(2) | =ELEVATION CONSTRAINT (RADIAN) |
| R(6) | =CLOUD DRIFT RATE (RADIAN/HR) |
| R(7) | =MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS) |
| HALFPI | =VALUE OF 90 DEGREES IN RADIAN |

*****OUTPUT-

PRINT STATEMENT NOTED UNDER FORMAT 7 IF CONSTRAINT IS NOT MET

*****INTERNAL PARAMETERS*

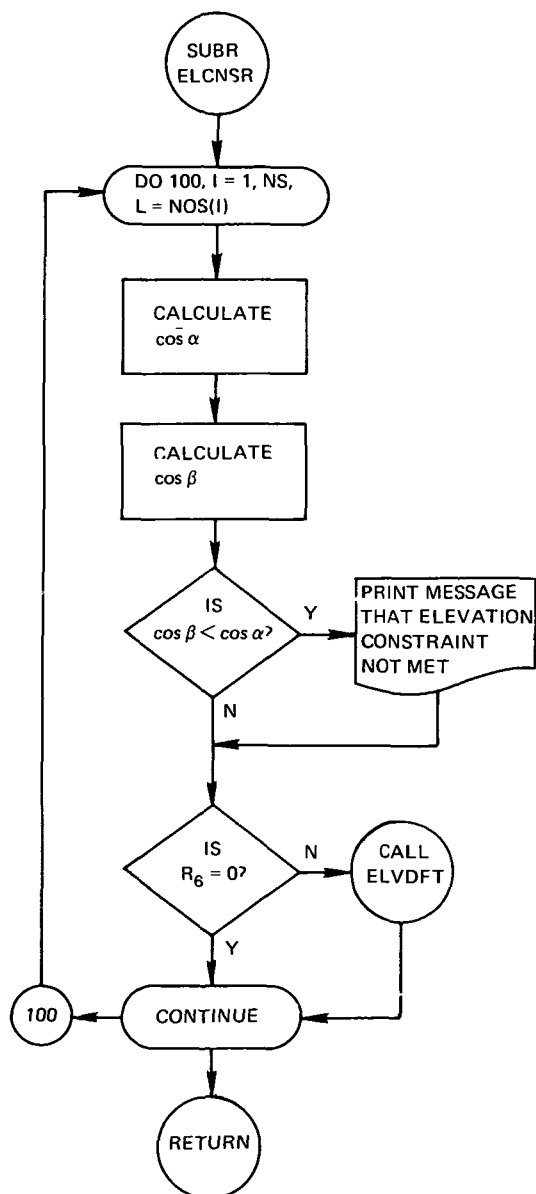
COSALF -COSINE OF THE ARC RADIUS OF THE DEFINED REGION
L -TRACKING STATION NUMBER

*****RESTRICTIONS*

NONE KNOWN

*****SUBPROGRAMS REQUIRED*

ELVDFT



*****SUBROUTINE ELMDFT*****

*****NASA HALLOPS VERSION OF 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

*****PURPOSE-

TO DETERMINE IF THE ELEVATION CONSTRAINT HOLDS DURING THE
REQUIRED TRACKING PERIOD.

*****METHOD-

THE LONGITUDINAL DIFFERENCE BETWEEN THE TRACKING STATION TO THE
EDGE OF THE REGION AT THE LATITUDE OF THE CLOUD ABOUT THIS
STATION AS DEFINED IN SUBROUTINE BLCMSR IS FOUND, THERE ARE TWO
POINTS ON THE EDGE OF THIS REGION AT THE LATITUDE OF THE CLOUD
WHICH ARE AT AN ARC DISTANCE EQUAL TO THE ARC RADIUS OF THIS
REGION, FOR AN EASTERLY DRIFT OF THE CLOUD AFTER RELEASE THE
POINT EAST OF THE TRACKING STATION IS REQUIRED, AND FOR THE
WESTERLY DRIFT THE POINT WEST OF THE TRACKING STATION IS
REQUIRED, THE PROBLEM NOW IS TO FIND OUT HOW LONG IT WILL TAKE
FOR THE CLOUD TO DRIFT TO THIS POINT ON THE EDGE OF THE DEFINED
REGION, IF IT IS SHORTER THAN THE GIVEN TRACKING PERIOD THEN THE
ERROR MESSAGE (FORMAT 1000) IS PRINTED.

*****INPUT-

| | |
|------------|---|
| COSALF | =COSINE OF THE ARC RADIUS OF THE DEFINED REGION |
| I | =TRACKING STATION NUMBER |
| SINCLT | =SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE |
| COSCLT | =COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE |
| NAME(3,12) | =NAME OF TRACKING STATIONS USED |
| RLAMD(12) | =LONGITUDE OF THE TRACKING STATION (RADIAN) |
| SINSLT(12) | =SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE |
| COSSLT(12) | =COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE |
| R(6) | =CLOUD DRIFT RATE (RADIAN/HR) |
| R(7) | =MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS) |

*****OUTPUT-

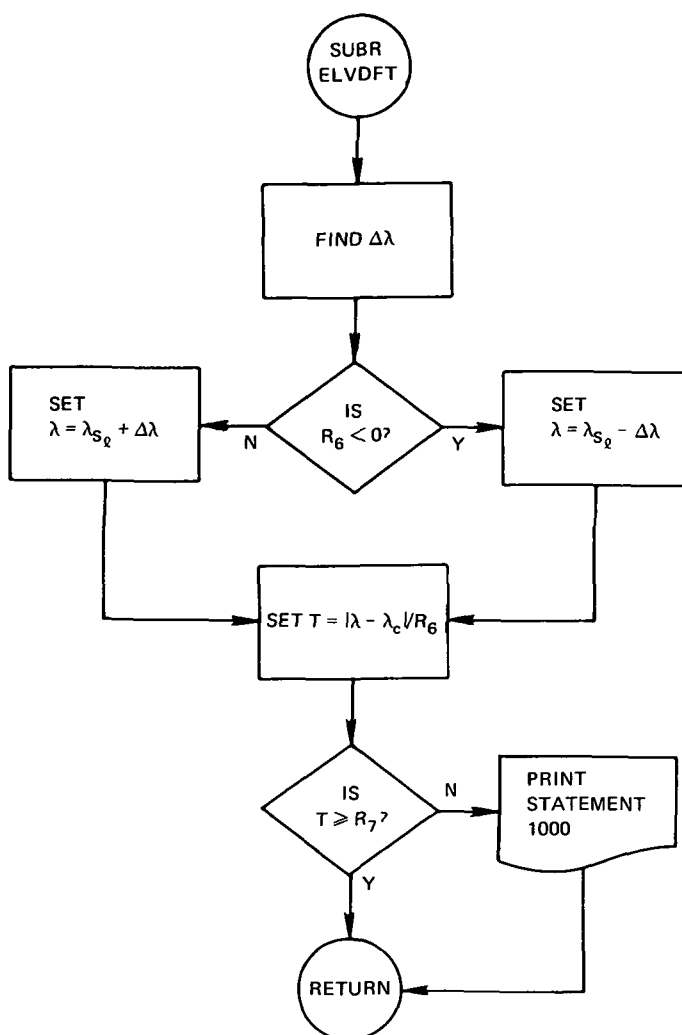
| | |
|------------|--|
| NAME(3,12) | =NAME OF TRACKING STATIONS USED |
| T | =TIME CONSTRAINT IS MET FOR GIVEN DRIFT RATE (HRS) |
| R(7) | =VALUE OF T IF T.LT. INPUT VALUE OF R(7)=IN HOURS |

*****RESTRICTIONS-

THE DRIFT RATE OF THE CLOUD IS ASSUMED TO BE REFLECTED IN A
CHANGE ONLY OF LONGITUDE VALUE FOR THE CLOUD'S POSITION AND IS
ASSUMED TO BE CONSTANT FOR THE EXPERIMENTAL PERIOD,
THE ELEVATION CONSTRAINT FOR THE POSITION OF THE AIRCRAFT AT
THE END OF THE EXPERIMENTAL PERIOD IS CALCULATED IN SUBROUTINE
EPAIR

*****SUBPROGRAMS REQUIRED-

NONE



***** SUBROUTINE AIRGLOW *****

***** NASA Wallops Version of 02/01/70

***** LANGUAGE-FORTRAN IV

***** MACHINE-GE 625

***** PURPOSE-
TO CALCULATE THE AIRGLOW BRIGHTNESS AS DEFINED,

***** METHOD-
THIS SUBROUTINE CALCULATES A VECTOR BETWEEN THE GEOCENTRIC COORDINATES OF THE STATION AND THE RELEASE POINT, THE ANGLE BETWEEN THIS VECTOR AND THE ZENITH OF THE STATION IS COMPUTED,

FROM THIS ANGLE THE AIRGLOW BRIGHTNESS IS COMPUTED,
IT ALSO USES SUBROUTINE EPAIR TO COMPUTE THE AIRGLOW BRIGHTNESS
AT DISCRETE POINTS FROM EACH TRACKING STATION TO THE CLOUD'S
POSITION AFTER RELEASE.

*****INPUT-

| | |
|------------|---|
| CGCX | -GEOCENTRIC X COMPONENT OF RELEASE POINT (ERU) |
| CGCY | -GEOCENTRIC Y COMPONENT OF RELEASE POINT (ERU) |
| CGCZ | -GEOCENTRIC Z COMPONENT OF RELEASE POINT (ERU) |
| SGCX(12) | -GEOCENTRIC X COMPONENT OF TRACKING STATION (ERU) |
| SGCY(12) | -GEOCENTRIC Y COMPONENT OF TRACKING STATION (ERU) |
| SGCZ(12) | -GEOCENTRIC Z COMPONENT OF TRACKING STATION (ERU) |
| PHI(12) | -GEODETIC LATITUDE OF TRACKING STATION (DEG) |
| SINSLN(12) | - SINE OF TRACKING STATION'S LONGITUDE |
| COSSLN(12) | -COSINE OF TRACKING STATION'S LONGITUDE |
| R(7) | -MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS) |
| NS | -THE NUMBER OF STATIONS USED IN THE PROGRAM |
| NOS(12) | -AN ARRAY CONTAINING THE STATION NUMBERS USED |
| LTR | -CONVERSION FACTOR FROM DEGREES TO RADIANS |

***** OUTPUT-

| | |
|----------|--|
| WX | -GEOCENTRIC X COMPONENT OF VECTOR FROM STATION TO -RELEASE POINT (ERU) |
| WY | -GEOCENTRIC Y COMPONENT OF VECTOR FROM STATION TO -RELEASE POINT (ERU) |
| WZ | -GEOCENTRIC Z COMPONENT OF VECTOR FROM STATION TO -RELEASE POINT (ERU) |
| USX | -X-COMPONENT OF UNIT VECTOR IN DIRECTION OF -TRACKING STATION'S ZENITH |
| USY | -Y-COMPONENT OF UNIT VECTOR IN DIRECTION OF -TRACKING STATION'S ZENITH |
| USZ | -Z-COMPONENT OF UNIT VECTOR IN DIRECTION OF -TRACKING STATION'S ZENITH |
| BA(12,7) | -AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE -GIVEN POSITION OF THE CLOUD (RAYLEIGHS) |
| C(12,7) | -COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION -OF THE TRACKING STATION TO THE CLOUD AND USED TO -SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS |
| JEND | -NUMBER OF DISCRETE VALUES STORED FOR -EXPERIMENTAL PERIOD DATA |

DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

*****RESTRICTIONS-

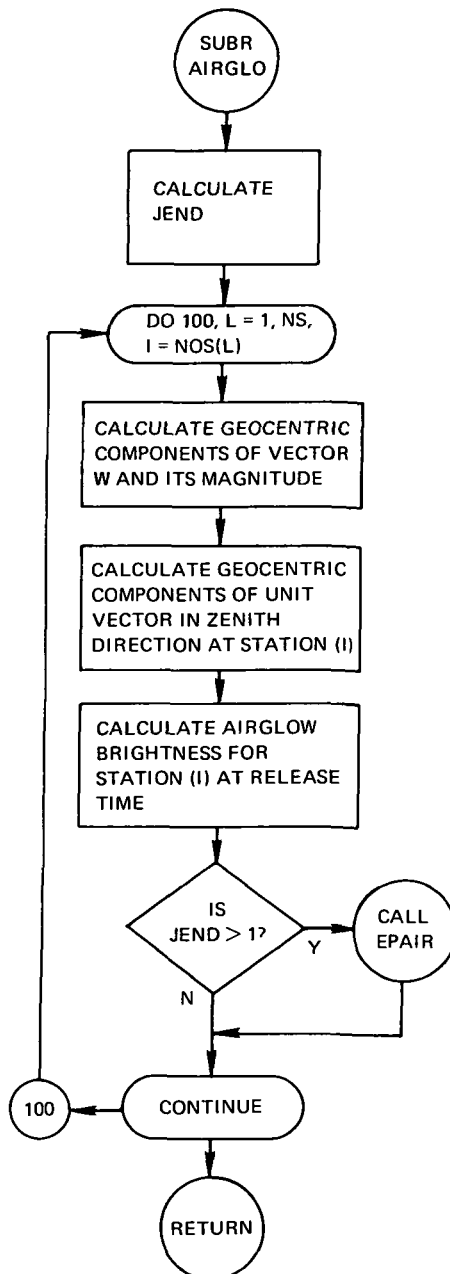
UP TO TWELVE TRACKING STATIONS CAN BE USED AND UP TO SEVEN DISCRETE VALUES FOR AIRGLOW BRIGHTNESS CAN BE COMPUTED FOR EACH TRACKING STATION,

*****SUBPROGRAMS REQUIRED-

EPAIR

*****REMARK-

ONLY ELEVEN TRACKING STATIONS CAN BE USED IF ONE OF THESE STATIONS IS A MOVING OR AIRCRAFT STATION,



***** SUBROUTINE EPAIR *****

*****NASA WALLOPS VERSION OF 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

***** PURPOSE-

TO CALCULATE THE DIFFERENT AIRGLOW BRIGHTNESS FOR EACH THIRTY (30) MINUTE TIME INTERVAL DURING THE DESIRED EXPERIMENT TIME.

*****METHOD-

THE GEOCENTRIC X,Y,Z-COMPONENTS OF THE VECTOR FROM EARTH CENTER TO THE CLOUD IS MODIFIED AT 30 MINUTE INCREMENTS TO INCORPORATE ITS POSITION AFTER RELEASE DUE TO THE EAST/WEST DRIFT OF THE CLOUD. THE CLOUD DRIFT IS ASSUMED TO BE CONSTANT AND IN THE SAME DIRECTION AND IS ASSUMED TO BE SOLELY A CHANGE IN LONGITUDE ANGLE. THE X,Y,Z-COMPONENTS OF THE VECTOR FROM STATION(1) TO THE POSITION OF THE CLOUD AT DISCRETE POINTS DURING THE EXPERIMENTAL PERIOD IS CALCULATED. THE AIRGLOW BRIGHTNESS AND 'IC' COEFFICIENT VALUES ARE FOUND AS IN SUBROUTINE AIRGLO FOR THESE POINTS.

THE ELEVATION CONSTRAINT FOR THE LAST POSITION OF THE MOVING TRACKING STATION IS CHECKED USING THE ZENITH ANGLE(SECZ),

*****INPUT-

| | |
|-----------|---|
| I | -INDEX FOR STATION NUMBER |
| JEND | -NUMBER OF DISCRETE VALUES STORED FOR -EXPERIMENTAL PERIOD DATA |
| R(6) | -CLOUD DRIFT RATE (RADIAN/HR) |
| CGCX | -GEOCENTRIC X COMPONENT OF RELEASE POINT (ERU) |
| CGCY | -GEOCENTRIC Y COMPONENT OF RELEASE POINT (ERU) |
| CGCZ | -GEOCENTRIC Z COMPONENT OF RELEASE POINT (ERU) |
| SGCX(12) | -GEOCENTRIC X COMPONENT OF TRACKING STATION (ERU) |
| SGCY(12) | -GEOCENTRIC Y COMPONENT OF TRACKING STATION (ERU) |
| SGCZ(12) | -GEOCENTRIC Z COMPONENT OF TRACKING STATION (ERU) |
| USX | -X-COMPONENT OF UNIT VECTOR IN DIRECTION OF -TRACKING STATION'S ZENITH |
| USY | -Y-COMPONENT OF UNIT VECTOR IN DIRECTION OF -TRACKING STATION'S ZENITH |
| USZ | -Z-COMPONENT OF UNIT VECTOR IN DIRECTION OF -TRACKING STATION'S ZENITH |
| PLAT(7) | -GEOCENTRIC LATITUDE OF AIRCRAFT DURING -EXPERIMENTAL PERIOD (DEG) |
| SINLON(7) | -SINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL -PERIOD |
| COSLON(7) | -COSINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL -PERIOD |

AGCX(7) -GEOCENTRIC X COMPONENT OF AIRCRAFT POSITION
 -DURING EXPERIMENTAL PERIOD (ERU)

AGCY(7) -GEOCENTRIC Y COMPONENT OF AIRCRAFT POSITION
 -DURING EXPERIMENTAL PERIOD (ERU)

AGCZ(7) -GEOCENTRIC Z COMPONENT OF AIRCRAFT POSITION
 -DURING EXPERIMENTAL PERIOD (ERU)

MOVE(12) -CODE NUMBER TO DETERMINE IF STATION COORDINATES
 -ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT
 -#0:FOR FIXED STATION
 -#1:FOR AIRCRAFT

DTR -CONVERSION FACTOR FROM DEGREES TO RADIANS

***** OUTPUT-

WPX(12,7) -VALUE OF GEOCENTRIC X COMPONENT OF VECTOR FROM
 -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE

WPY(12,7) -VALUE OF GEOCENTRIC Y COMPONENT OF VECTOR FROM
 -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE

WPZ(12,7) -VALUE OF GEOCENTRIC Z COMPONENT OF VECTOR FROM
 -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE

BA(12,7) -AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE
 -GIVEN POSITION OF THE CLOUD (RAYLEIGHS)

C(12,7) -COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION
 -OF THE TRACKING STATION TO THE CLOUD AND USED TO
 -SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS

*****RESTRICTIONS-

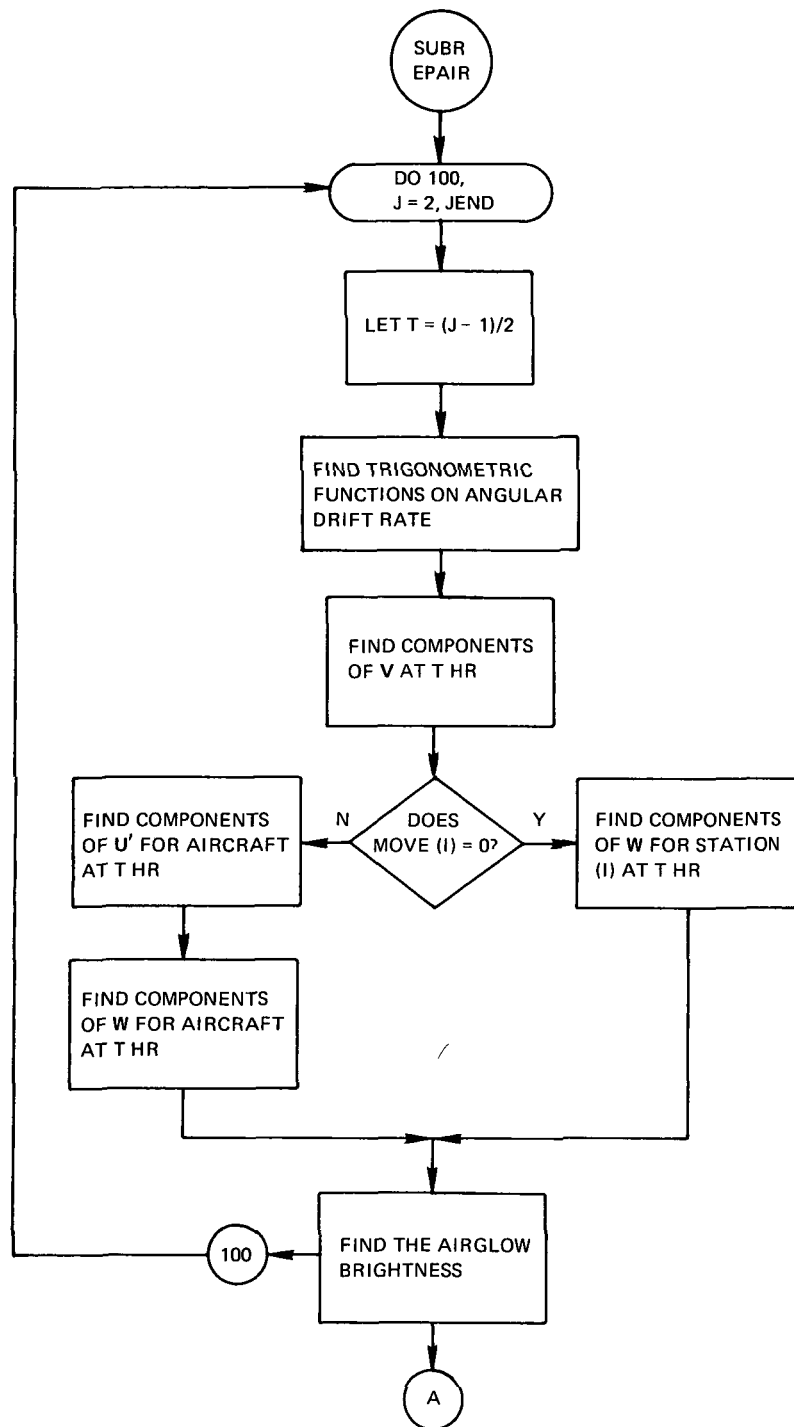
UP TO TWELVE TRACKING STATIONS CAN BE USED AND UP TO SEVEN
 DISCRETE VALUES FOR AIRGLOW BRIGHTNESS CAN BE COMPUTED FOR EACH
 TRACKING STATION.

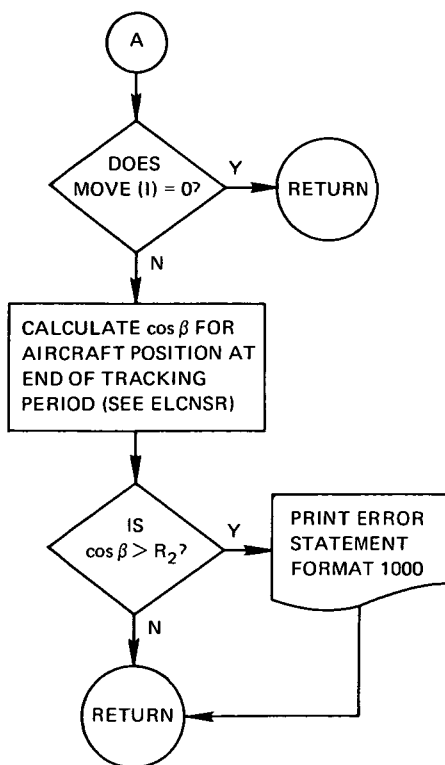
*****SUBPROGRAMS REQUIRED-

NONE

*****REMARK-

ONLY ELEVEN TRACKING STATIONS CAN BE USED AS INPUT IF ONE OF
 THESE STATIONS IS AN AIRCRAFT.





*****SUBROUTINE TIME *****

FUNCTION TIME (DAYNUM)

PURPOSE

TO COMPUTE THE GREENWICH MEAN SIDEREAL TIME AT ZERO HOURS
UNIVERSAL TIME FOR ANY JULIAN DATE AFTER 2415020.0 OR
JANUARY 0,1900

LANGUAGE

FORTRAN IV

CALLING SEQUENCE

GMSIDT = TIME(DAYNUM) (TIME IS A DOUBLE PRECISION FUNCTI

INPUTS

DAYNUM = JULIAN DATE AT ZERO HOURS UNIVERSAL TIME

OUTPUTS

TIME(DAYNUM) = GREENWICH MEAN SIDEREAL TIME AT ZERO HOURS
UNIVERSAL, (HOUR ANGLE OF THE FIRST POINT OF ARIES.)
ANSWER IS IN HOURS AND DECIMAL FRACTIONS OF HOURS, TO
CONVERT TO DEGREES MULTIPLY BY 15.0 (DOUBLE PRECISION)

REFERENCE

1. AMERICAN EPHEMERIS AND NAUTICAL ALMANAC, 1961
2. EXPLANATORY SUPPLEMENT TO AMERICAN EPHEMERIS AND NAUTICAL ALMANAC, (HER MAJESTY'S STATIONARY OFFICE, LONDON

METHOD

VALUES OF GREENWICH MEAN SIDEREAL TIME ARE OBTAINED BY ADDING TWELVE HOURS TO NEWCOMB'S (A.P.A.E. 6,1898, PART I) EXPRESSION FOR THE RIGHT ASCENSION OF THE MEAN SUN.

RESTRICTIONS

NONE KNOWN

SUBPROGRAMS REQUIRED

NONE

ANALYSIS

FRANK E. MOSE
APPLIED MATH SECTION
NASA
WALLOPS STATION, VA.

PROGRAMMER

BENNIS MELVIN
APPLIED MATH SECTION
NASA
WALLOPS STATION, VA.

*****SUBROUTINE DAYNUM*****

FUNCTION DAYNUM(MONTH, DAY, YEAR)

PURPOSE

TO COMPUTE THE JULIAN DATE AT ZERO HOURS UNIVERSAL TIME FOR ANY DAY FROM THE YEAR 1600 TO THE YEAR 2000

LANGUAGE

FORTRAN IV

CALLING SEQUENCE

Y = DAYNUM(MONTH, DAY, YEAR)
YEAR, AND DAY BEING FLOATING POINT VARIABLES,
MONTH BEING AN INTEGER VARIABLE

INPUTS

MONTH = CALENDAR MONTH (INTEGER)
DAY = CALENDAR DAY (FLOATING POINT)
YEAR = CALENDAR YEAR (FLOATING POINT)

OUTPUTS

DAYNUM = JULIAN DAY NUMBER AT ZERO HOUR FOR THE ABOVE DATE

REFERENCE

1. AMERICAN EPHEMERIS AND NAUTICAL ALMANAC

METHOD

THE NUMBER OF DAYS ELAPSED FROM ZERO HOURS UNIVERSAL TIME, JANUARY 0, 1600 ARE ADDED TO THE JULIAN DAY NUMBER OF THAT PARTICULAR DAY (2305446.5)

RESTRICTIONS

PROGRAM CHECKED TO THE YEAR 2000 A.D.

SUBPROGRAMS REQUIRED

NONE

ANALYSIS

FRANK E. HOGGE
APPLIED MATHEMATICS SECTION
WALLOPS STATION, VA.

PROGRAMMER

DENNIS MELVIN
APPLIED MATHEMATICS SECTION
WALLOPS STATION, VA.

*****SUBROUTINE SUNMN*****

*****NASA WALLOPS VERSION OF 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

*****PURPOSE-

TO DETERMINE THE DAILY TIME INTERVAL FOR WHICH THE SUN AND MOON
WILL BE BELOW THE RESPECTIVE ELEVATION ANGLES AT EACH TRACKING
STATION'S LOCAL HORIZON.

*****METHOD-

THE SOLUTION FOR DETERMINING THE TIME PERIODS FOR WHICH THE SUN
AND MOON CONSTRAINTS ARE MET FOR EACH STATION ARE DEVELOPED
USING SIMILAR ANALYSIS, AN APPROXIMATE TIME FOR THE DEFINED
CONSTRAINT (SUN OR MOON) TO BE MET IS DETERMINED FROM THE
FIRST INTERVAL FOR THE DAY PLUS DELTA(M), THE POSITION OF THE
SUN OR MOON FOR THAT TIME IS FOUND AND IS THEN TRANSFORMED TO
THE TOPOCENTRIC COORDINATES OF THE TRACKING STATION, THE
ELEVATION ANGLE OF THE SUN (OR MOON) AT THIS TRACKING STATION
IS FOUND FOR THE CURRENT POSITION OF THE SUN (MOON), A THREE
POINT INTERPOLATION METHOD IS USED TO APPROXIMATE THE NEXT
GUESS AT THE TIME FOR WHICH THE CONSTRAINT IS MET, THE PROCESS
OF DEFINING THE POSITION OF THE SUN (MOON) FOR THE LATEST
UNIVERSAL TIME, TRANSFORMING TO TOPOCENTRIC COORDINATES AND
CHECKING THE ELEVATION ANGLE IS REPEATED UNTIL EITHER A TIME IS
FOUND FOR WHICH THE RATIO OF THE ELEVATION ANGLE TO THE
REQUIRED CONSTRAINT IS ACCURATE TO .0001 OR THAT THE ITERATIVE
PROCESS IS TOO LONG AND IMPLIES A WEAK CONVERGENCE OR
DIVERGENCE, THE TIME PERIOD FOUND IS STORED AS THE SECOND TIME
PERIOD FOR THE DAY, THE MAIN PROGRAM TREATS THIS AS THE FIRST
TIME PERIOD OF THE NEXT DAY BY SUBTRACTING 24 HOURS FROM THESE
VALUES.

IF A MOVING TRACKING STATION IS INPUT, THEN THE TIME OF DAY
FOR WHICH ITS POSITION AT THE END OF THE EXPERIMENTAL PERIOD
SATISFIES THE SUN AND MOON ELEVATION CONSTRAINTS IS FOUND.
THESE TIMES ARE STORED IN THE WINDOW ARRAY AND THE WINDOW TIMES
FOR THE MOVING TRACKING STATION ARE DETERMINED SUCH THAT THE
SUN AND MOON CONSTRAINTS WILL BE SATISFIED FOR ITS POSITION AT
TIME OF RELEASE AND DURING THE EXPERIMENTAL PERIOD,

*****INPUT-

NS -THE NUMBER OF STATIONS USED IN THE PROGRAM

NOS(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED

WINDOW(6,5,12) -THE DAILY RELEASE WINDOW START/STOP TIMES.

-1ST INDEX FOR STORING START/STOP TIMES,
 -1 FOR START TIME
 -2 FOR STOP TIME
 -2ND INDEX FOR THE CONSTRAINT
 - 3=SUN
 - 4=MOON
 -3RD INDEX FOR THE STATION NUMBER

KYEAR -YEAR NUMBER FOR STARTING CALCULATIONS

J -CURRENT NUMBER OF DAYS PAST JANUARY 0 OF 'KYEAR'

M -INDEX TO INDICATE CONSTRAINT
 - 3,SUN
 - 4,MOON

DELTA(3) -APPROXIMATE PERIOD OF SUN MOTION (HRS)

DELTA(4) -APPROXIMATE PERIOD OF MOON MOTION (HRS)

NAME(3,12) -NAME OF TRACKING STATIONS USED

LAMBDA(12) -LONGITUDE OF TRACKING STATION (DEG)

RVS(12) -RADIUS VECTOR FROM EARTH CENTER TO TRACKING
 -STATION (RU)

GHA -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS
 -UNIVERSAL TIME (HRS)

R(3) -SUN ELEVATION CONSTRAINT (RADIAN)

R(4) -MOON ELEVATION CONSTRAINT (RADIAN)

ANS(3) -DISTANCE FROM EARTH CENTER TO SUN (ASTRONOMICAL
 -UNITS)

ANS(4) -INERTIAL X COMPONENT OF VECTOR FROM EARTH CENTER
 -TO SUN (AU)

ANS(5) -INERTIAL Y COMPONENT OF VECTOR FROM EARTH CENTER
 -TO SUN (AU)

ANS(6) -INERTIAL Z COMPONENT OF VECTOR FROM EARTH CENTER
 -TO SUN (AU)

ANS(9) -DISTANCE FROM EARTH CENTER TO MOON (RU)

ANS(10) -INERTIAL X COMPONENT OF VECTOR FROM EARTH CENTER
 -TO MOON (RU)

ANS(11) -INERTIAL Y COMPONENT OF VECTOR FROM EARTH CENTER
 -TO MOON (RU)

ANS(12) -INERTIAL Z COMPONENT OF VECTOR FROM EARTH CENTER
 -TO MOON (RU)

AGC2TC(3,3) -ELEMENTS OF TRANSFORMATION MATRIX FROM THE
 -INERTIAL SYSTEM TO THE TOPOCENTRIC SYSTEM

DTR -CONVERSION FACTOR FROM DEGREES TO RADIAN

RTH -CONVERSION FACTOR FROM RADIAN TO HOURS

HTR -CONVERSION FACTOR FROM HOURS TO RADIAN

DAILY RELEASE WINDOW FOR SKY TARGET EXPERIMENTS

AU -CONVERSION FACTOR FROM ASTRONOMICAL UNITS TO
 -EARTH RADII UNITS
 MOVE(12) -CODE NUMBER TO DETERMINE IF STATION COORDINATES
 -ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT
 -*0, FOR FIXED STATION
 -*1, FOR AIRCRAFT
 SINLAT(7) -SINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING
 -EXPERIMENTAL PERIOD
 COSLAT(7) -COSINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING
 -EXPERIMENTAL PERIOD
 SINLON(7) -SINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL
 -PERIOD
 COSLON(7) -COSINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL
 -PERIOD
 RVA(7) -DISTANCE FROM EARTH CENTER TO AIRCRAFT DURING
 -EXPERIMENTAL PERIOD (GRU)
 RLAT(7) -GEOCENTRIC LATITUDE OF AIRCRAFT DURING
 -EXPERIMENTAL PERIOD (RADIANs)
 RLON(7) -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD
 -(RADIANs)
 JEND -NUMBER OF DISCRETE VALUES STORED FOR
 -EXPERIMENTAL PERIOD DATA

*****OUTPUT-

DELTA(3) -APPROXIMATE PERIOD OF SUN MOTION (HRS)
 DELTA(4) -APPROXIMATE PERIOD OF MOON MOTION (HRS)
 WINDOW(6,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES,
 -1ST INDEX FOR STORING START/STOP TIMES,
 -3 FOR START TIME
 -4 FOR STOP TIME
 -2ND INDEX FOR THE CONSTRAINT
 -3=SUN
 -4=MOON
 -3RD INDEX FOR THE STATION NUMBER

*****RESTRICTIONS-

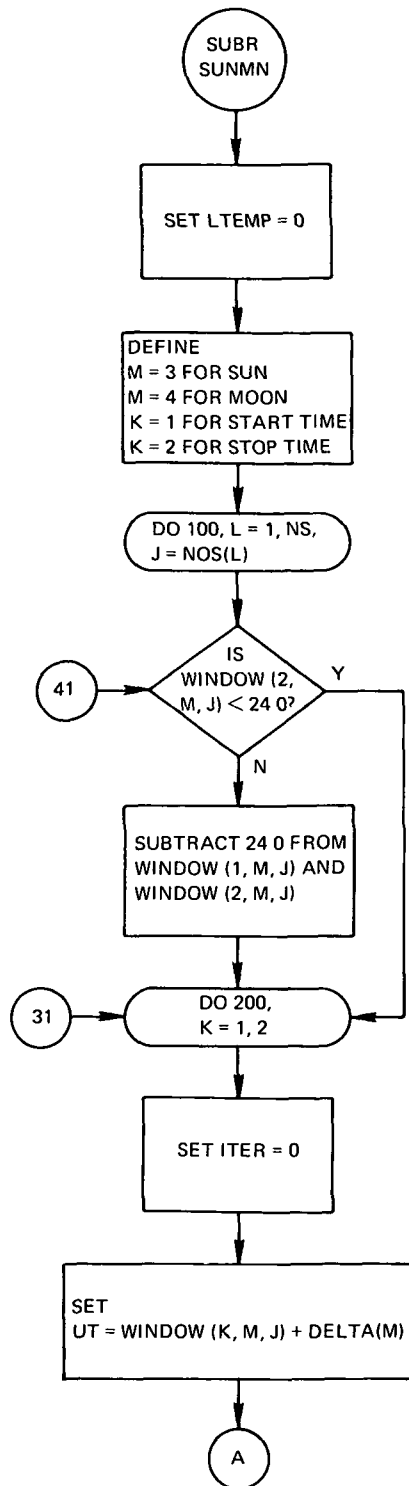
TIME PERIODS FOR UP TO TWELVE TRACKING STATIONS CAN BE FOUND.
 ROUTINE DEPENDS UPON THE AVAILABLE DATA ON THE SUN AND MOON
 POSITION TO BE DEFINED IN THE EPHEMERIS TABLES FOR THE DATES
 REQUIRED, PRESENT VERSION CONTAINS DATA FOR THE YEARS 1972 THRU
 1980. ADDITIONAL DATA CAN BE MADE AVAILABLE WHEN NECESSARY.

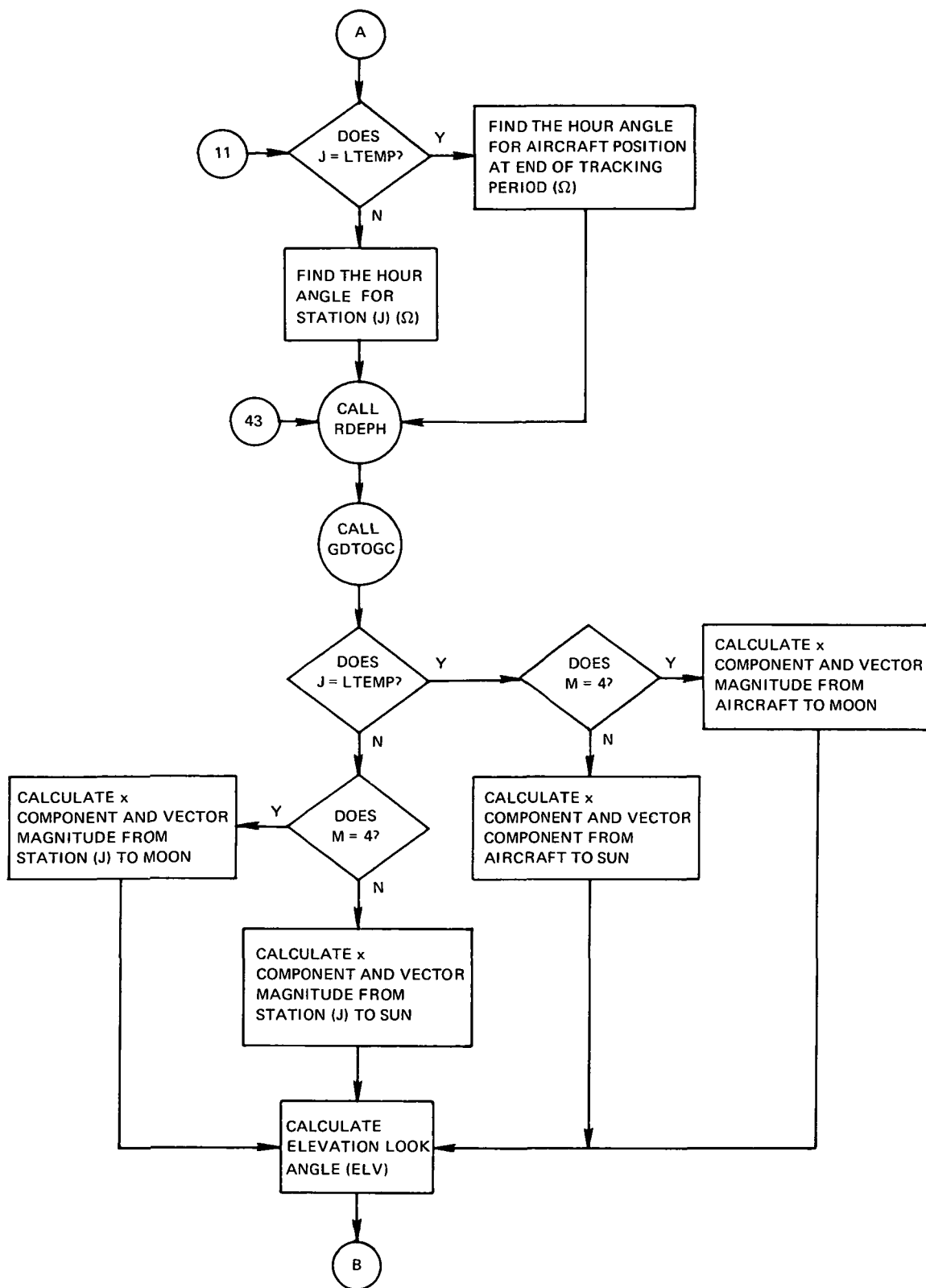
*****SUBPROGRAMS REQUIRED-

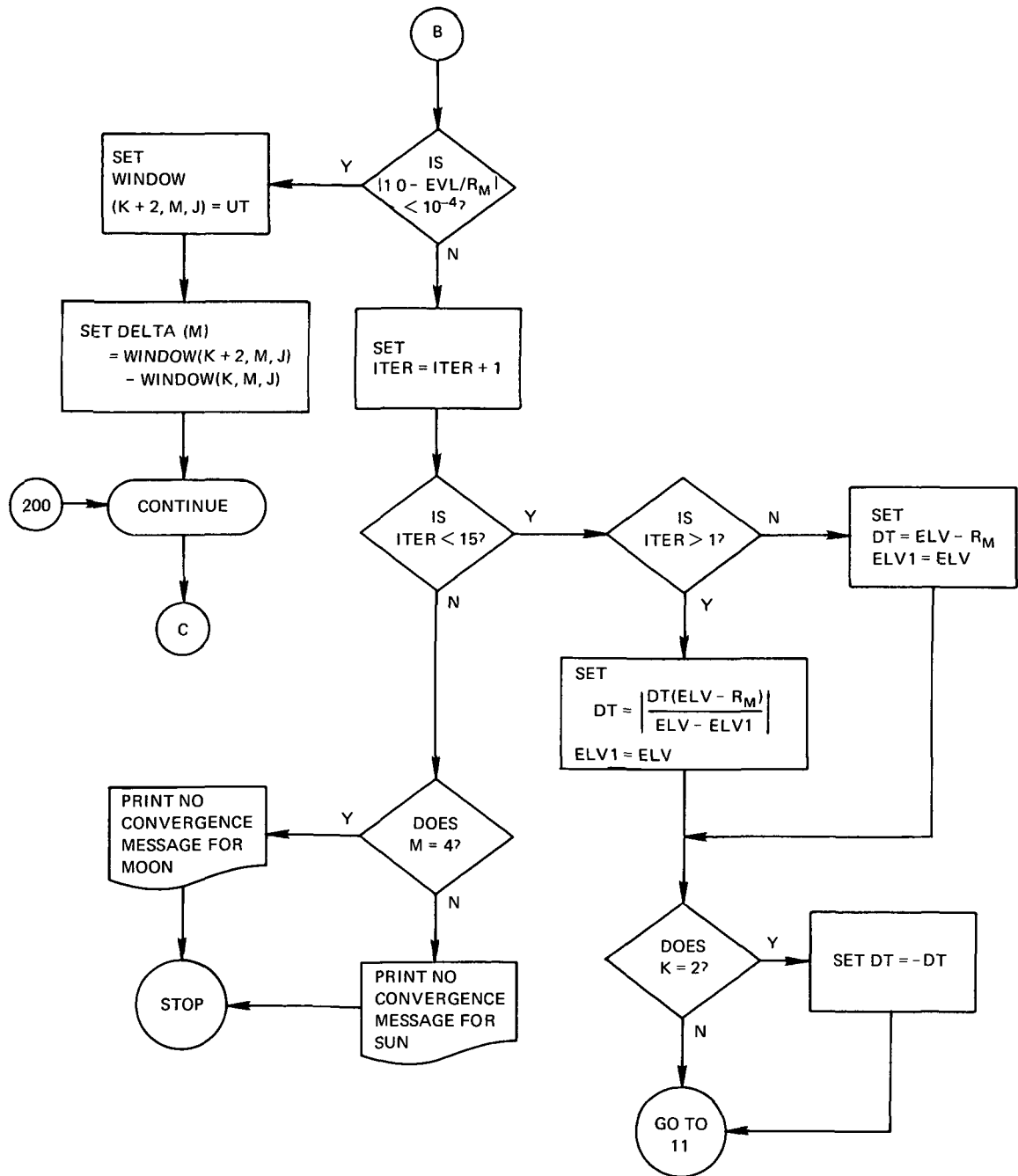
RDEPH
 EPHEMERIS TABLES
 GC2TC

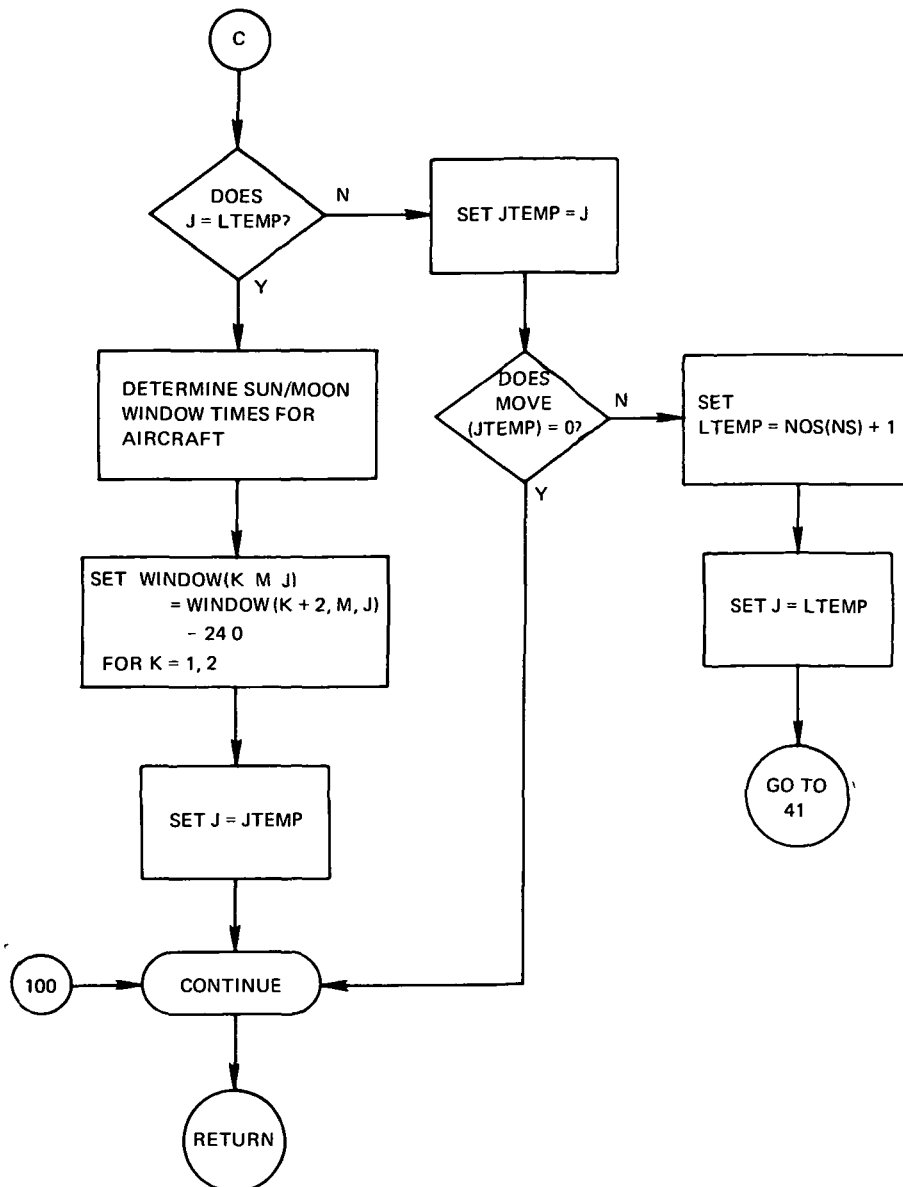
*****REMARK-

ONLY ELEVEN TRACKING STATIONS CAN BE USED AS INPUT IF ONE OF
 THESE STATIONS IS AN AIRCRAFT,









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*****SUBROUTINE GC2TC*****
*****NASA WALLORS VERSION OF 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE=GE 625

*****PURPOSE-
  TO COMPUTE THE ELEMENTS OF THE TRANSFORMATION MATRIX FOR THE
  ROTATION FROM INERTIAL RECTANGULAR COORDINATES TO A TOPOCENTRIC
  SYSTEM WITH ORIGIN AT THE ORIGIN OF THE INERTIAL SYSTEM,

*****METHOD-
  GIVEN A POINT OF GEOCENTRIC LATITUDE AND LONGITUDE AND THE
  CURRENT HOUR ANGLE, CALCULATE THE ELEMENTS OF THE TRANSFORMATION
  MATRIX, COORDINATE TRANSFORMATION BY THIS MATRIX WILL TRANSFORM
  THE COMPONENTS FROM AN INERTIAL RECTANGULAR SYSTEM TO A
  TOPOCENTRIC SYSTEM, THE INERTIAL COORDINATE SYSTEM IS DEFINED AS
  HAVING ITS ORIGIN AT THE EARTH'S CENTER WITH THE X-AXIS IN THE
  DIRECTION OF THE FIRST POINT OF ARIES, THE Y-AXIS IN THE
  EQUATORIAL PLANE 90 DEGREES COUNTERCLOCKWISE FROM X AND THE Z-
  AXIS DIRECTED TOWARDS THE ZENITH IN A RIGHT HANDED SYSTEM, THE
  TOPOCENTRIC SYSTEM HAS ITS X-AXIS DIRECTED TOWARDS THE
  GEOCENTRIC INPUT POINT, THE Z-AXIS DIRECTED TOWARD THE SAME
  LATITUDE BUT AT 180 DEGREES FROM THE INPUT LONGITUDE AND THE Y-
  AXIS POSITIONED AS TO COMPLETE THE RIGHT HANDED SYSTEM,

*****INPUT-

  HA          -THE STATION'S HOUR ANGLE (RADIAN)
  J           -THE INDEX NUMBER OF THE STATION
  NOS(12)     -AN ARRAY CONTAINING THE STATION NUMBERS USED
  NS          -THE NUMBER OF STATIONS USED IN THE PROGRAM
  SINSLT(12)  -SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE
  COSSLT(12)  -COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE
  SINLAT(7)   -SINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING
               -EXPERIMENTAL PERIOD
  COSLAT(7)   -COSINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING
               -EXPERIMENTAL PERIOD

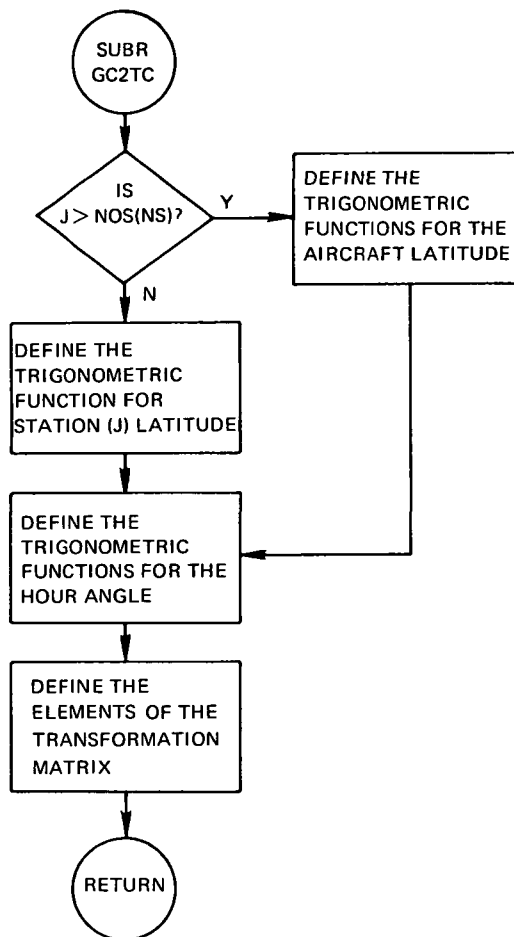
*****OUTPUT-

  AGC2TC(3,3) -ELEMENTS OF TRANSFORMATION MATRIX FROM THE
               -INERTIAL SYSTEM TO THE TOPOCENTRIC SYSTEM

*****RESTRICTIONS-
  NS CANNOT BE GREATER THAN TWELVE,

*****SUBPROGRAMS REQUIRED-
  NONE

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*****SUBROUTINE ILLUM*****

*****NASA Wallops version of 02/01/70

*****LANGUAGE-FORTRAN IV

*****MACHINE-GE-625

*****PURPOSE-

TO DETERMINE THE TIME INTERVAL FOR THE CURRENT DAY FOR WHICH THE POSITION OF THE CLOUD WILL BE WITHIN THE EARTH'S SHADOW.

*****METHOD-

THIS SUBROUTINE ASSUMES THAT THE DECLINATION OF THE SUN IS FIXED FOR THE CURRENT DAY; THIS ASSUMPTION WILL HAVE AN ERROR OF LESS THAN 30 SECONDS IN TIME FOR A CLOUD AT LONGITUDE OF 75 DEGREES. THE SUBROUTINE FIRST FINDS THE SUN'S DECLINATION AT ZERO HOURS UNIVERSAL TIME; THEN A CHECK IS MADE TO SEE IF THE CLOUD'S POSITION WILL BE WITHIN THE PRE-DEFINED EARTH SHADOW REGION. IF SO, THEN THE TIME ENTERING AND LEAVING THIS REGION DUE TO THE GEOCENTRIC POSITION OF THE CLOUD IS FOUND. THE CLOUD'S GROWTH AND DRIFT AFTER RELEASE IS USED TO DEFINE THE ILLUMINATION OF THE TOTAL CLOUD. THE RESULT OF THIS SUBROUTINE IS TO DEFINE THE TIME PERIOD(S) FOR POSSIBLE RELEASE WHICH EXCLUDES THE EARTH SHADOW REGION.

*****INPUT-

| | |
|--------|--|
| KYEAR | -YEAR NUMBER FOR STARTING CALCULATIONS |
| I | -CURRENT NUMBER OF DAYS PAST JANUARY 0 OF 'KYEAR' |
| PHIP | -GEOCENTRIC LATITUDE OF RELEASE POINT (RADIAN) |
| SINCLT | -SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE |
| COSCLT | -COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE |
| SHADOW | -RADIUS OF EARTH SHADOW REGION (RADIAN) |
| GAMMA | -COSINE OF 'SHADOW' |
| DRIFT | -THE SPACE-FIXED DRIFT OF CLOUD (DEG/HR) |
| GHA | -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS -UNIVERSAL TIME (HRS) |
| ANS(1) | -RIGHT ASCENSION OF THE SUN (RADIAN) |
| ANS(2) | -DECLINATION OF THE SUN (RADIAN) |
| RTH | -CONVERSION FACTOR FROM RADIAN TO HOURS |

*****OUTPUT-

| | |
|---------------|---|
| WINDOW(6,1,1) | -THE DAILY RELEASE WINDOW START/STOP TIMES, -1ST INDEX FOR STORING START/STOP TIMES, -1,3,5 FOR START TIMES -2,4,6 FOR STOP TIMES -2ND INDEX FOR THE CONSTRAINT - 1=EARTH SHADOW -3RD INDEX DUMMY (NORMALLY STATION NUMBER) |
|---------------|---|

*****INTERNAL PARAMETERS-

| | |
|--------|--|
| C1 | -TOTAL SPACE-FIXED ANGULAR DISPLACEMENT DUE TO -CLOUD DRIFT FOR THE EXPERIMENTAL PERIOD, |
| C2 | -ONE-HALF OF THE SPACE-FIXED ANGULAR DISPLACEMENT -DUE TO CLOUD GROWTH FOR THE EXPERIMENTAL PERIOD, |
| X0 | -RIGHT ASCENSION OF EARTH SHADOW CENTER (RADIAN) |
| Y0 | -DECLINATION OF EARTH SHADOW CENTER (RADIAN) |
| PHIP2 | -LARGEST VALUE OF CLOUD'S DECLINATION DUE TO -CLOUD GROWTH (RADIAN) |
| PHIP3 | -SMALLEST VALUE OF CLOUD'S DECLINATION DUE TO -CLOUD GROWTH (RADIAN) |
| ST(3) | -START TIME AS CALCULATED FOR EACH SIDE OF -TRIANGLE MODEL OF CLOUD'S REGION, |
| STP(3) | -STOP TIME AS CALCULATED FOR EACH SIDE OF -TRIANGLE MODEL OF CLOUD'S REGION, |

*****RESTRICTIONS-

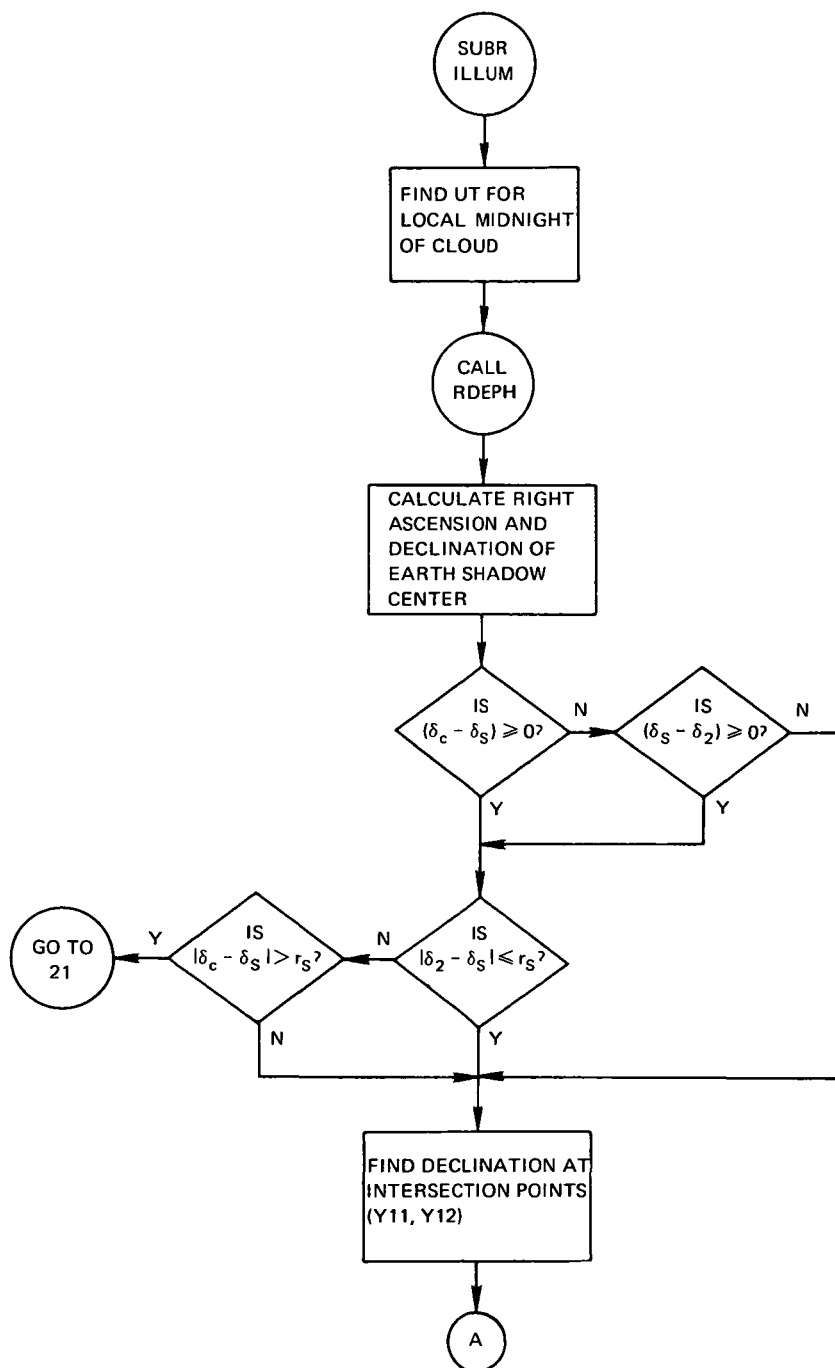
ACCURACY OF OUTPUT AS DEFINED ABOVE UNDER 'METHOD'.

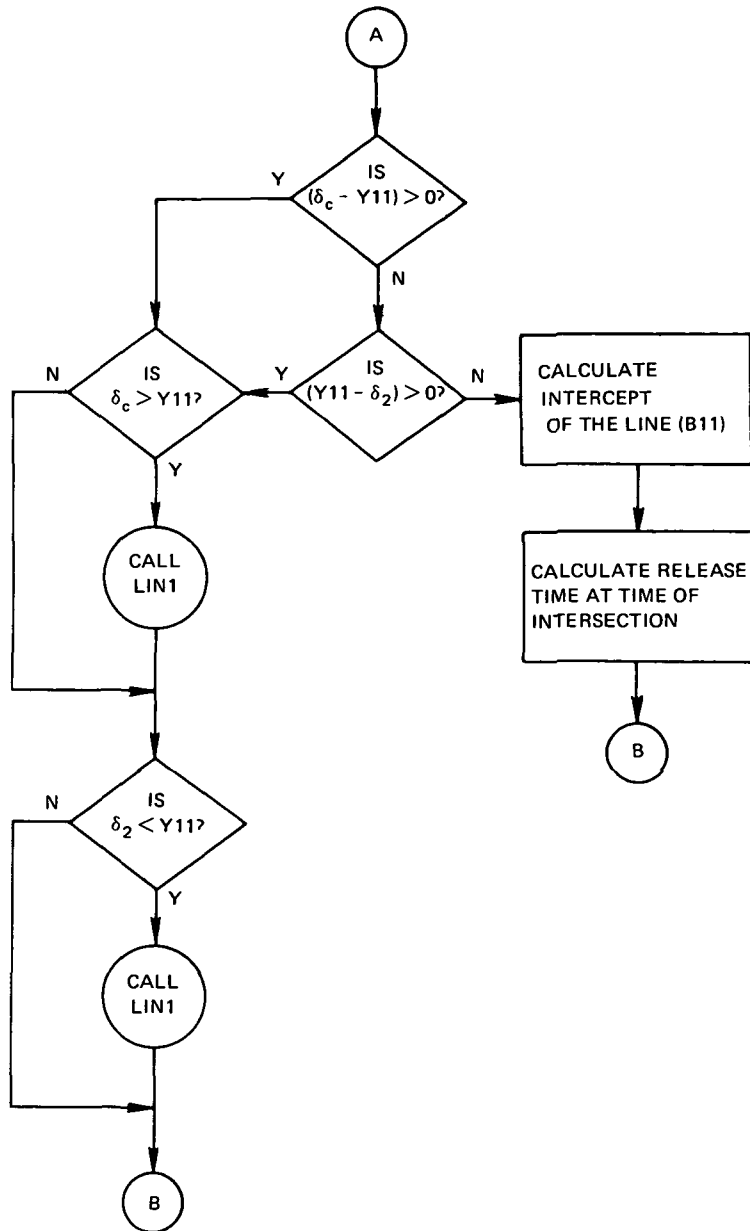
*****SUBPROGRAMS REQUIRED-

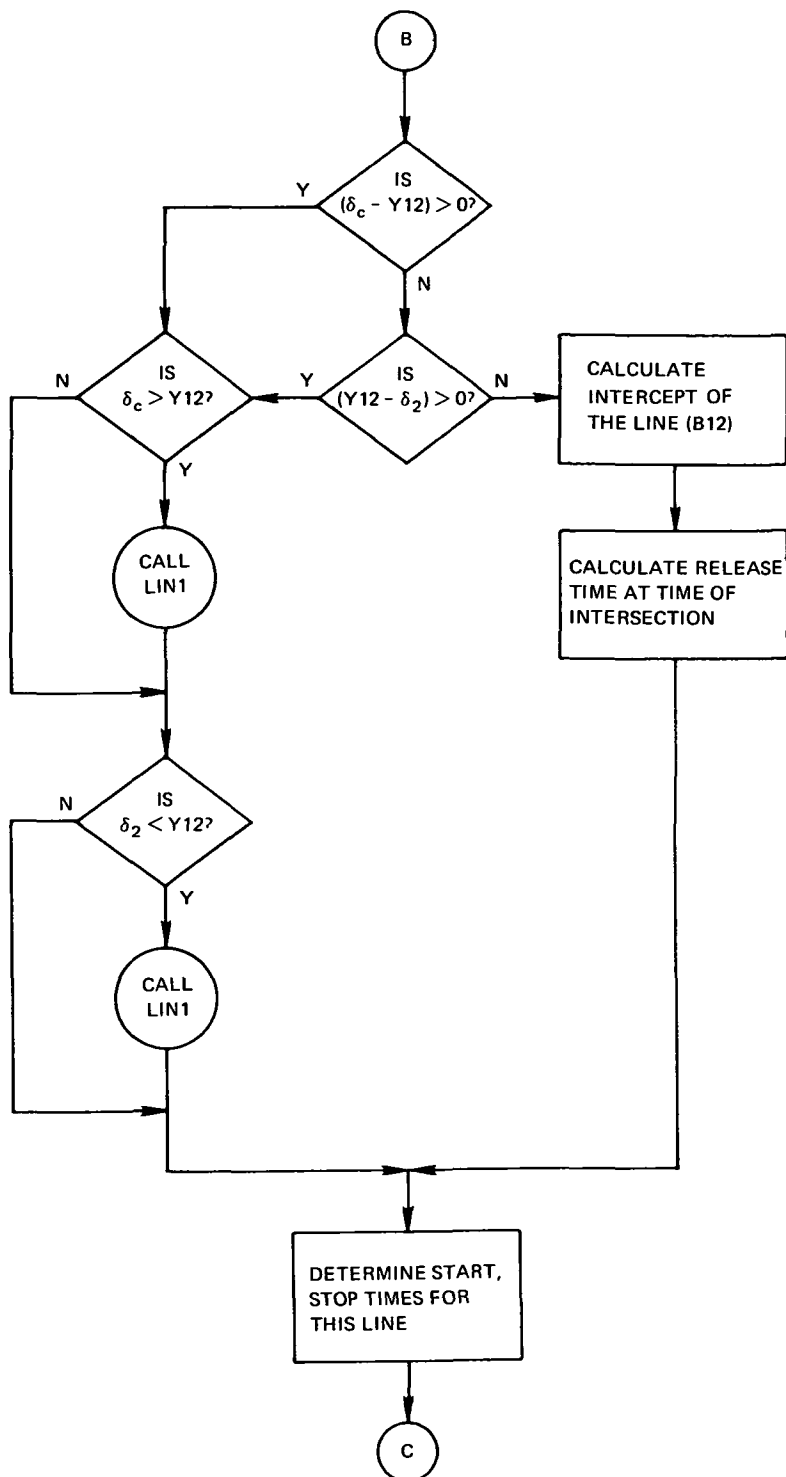
LIN1

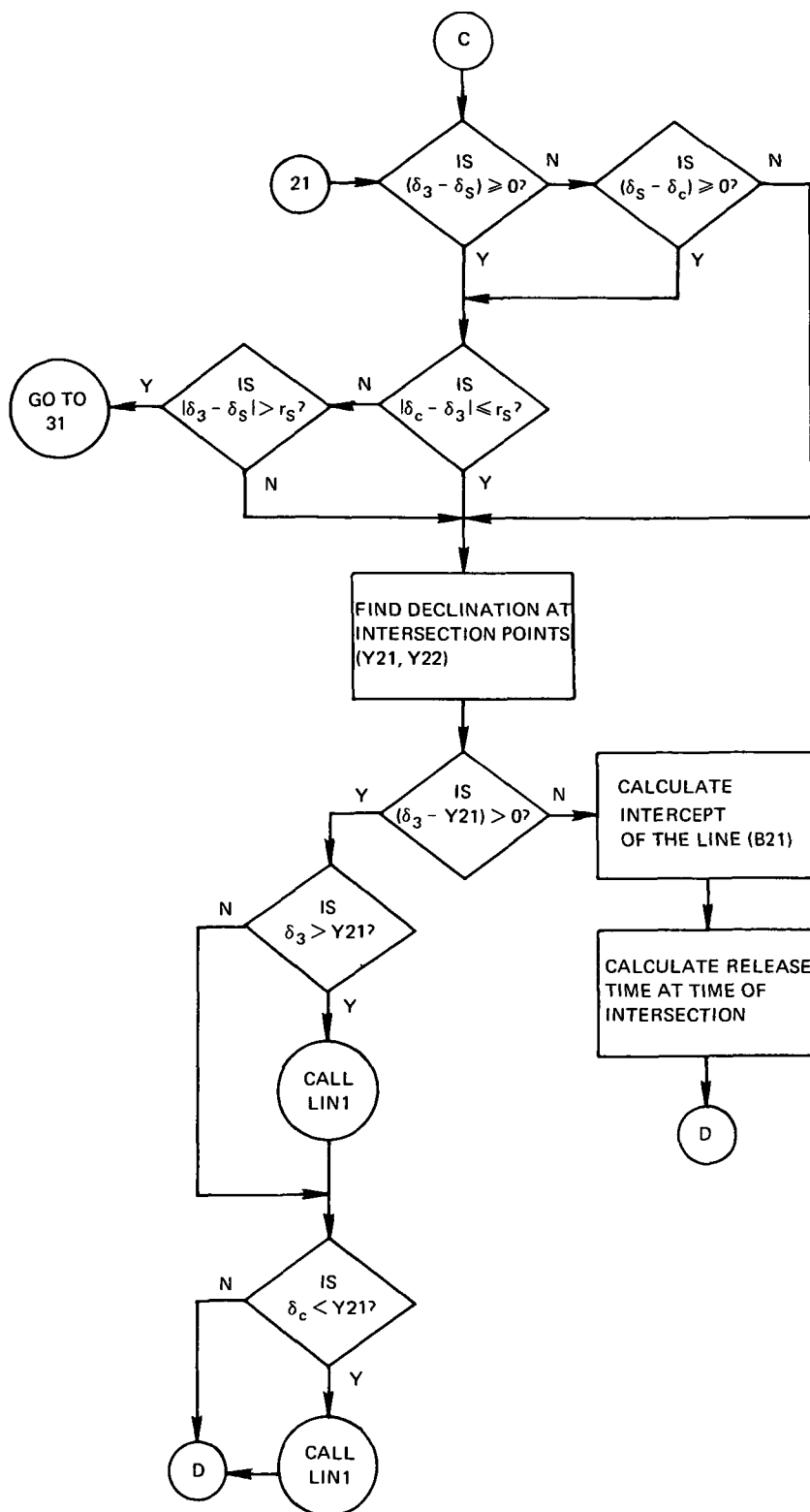
RDEPH

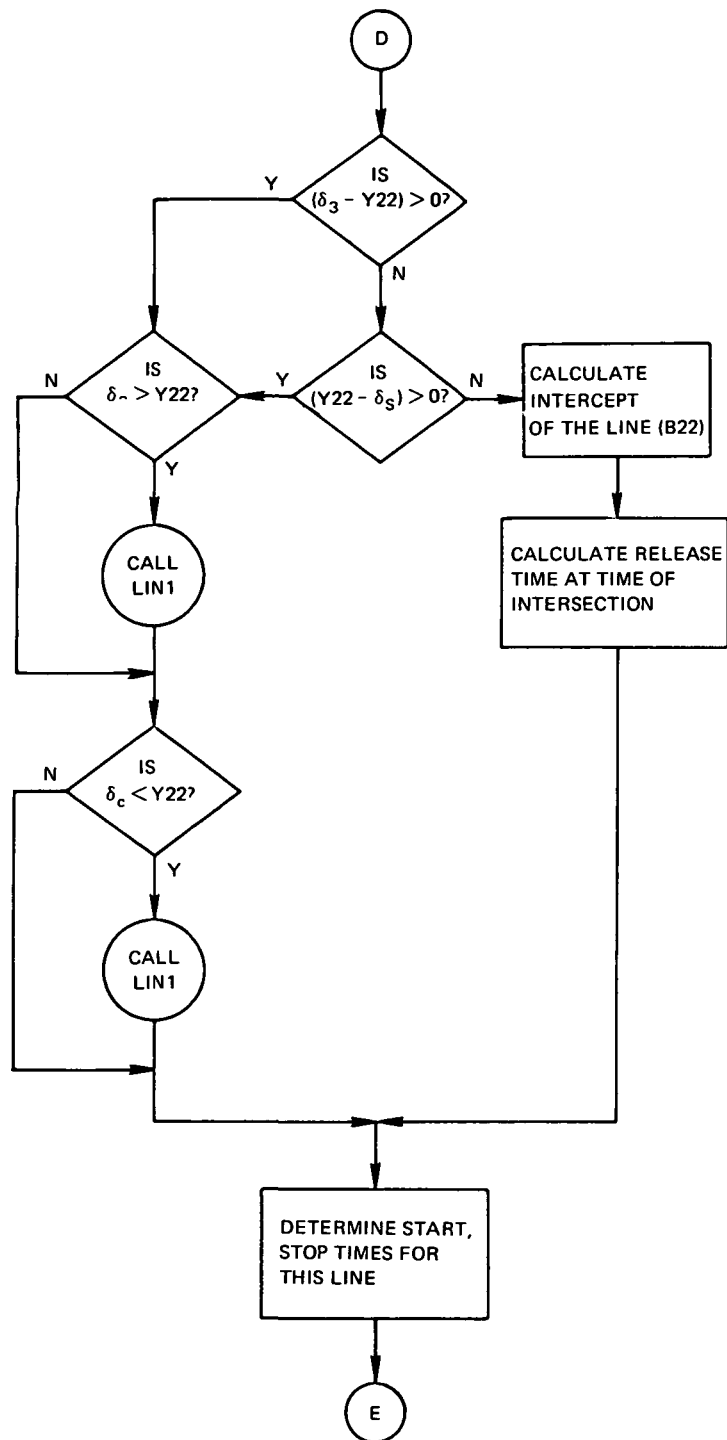
EPHEMERIS TABLES

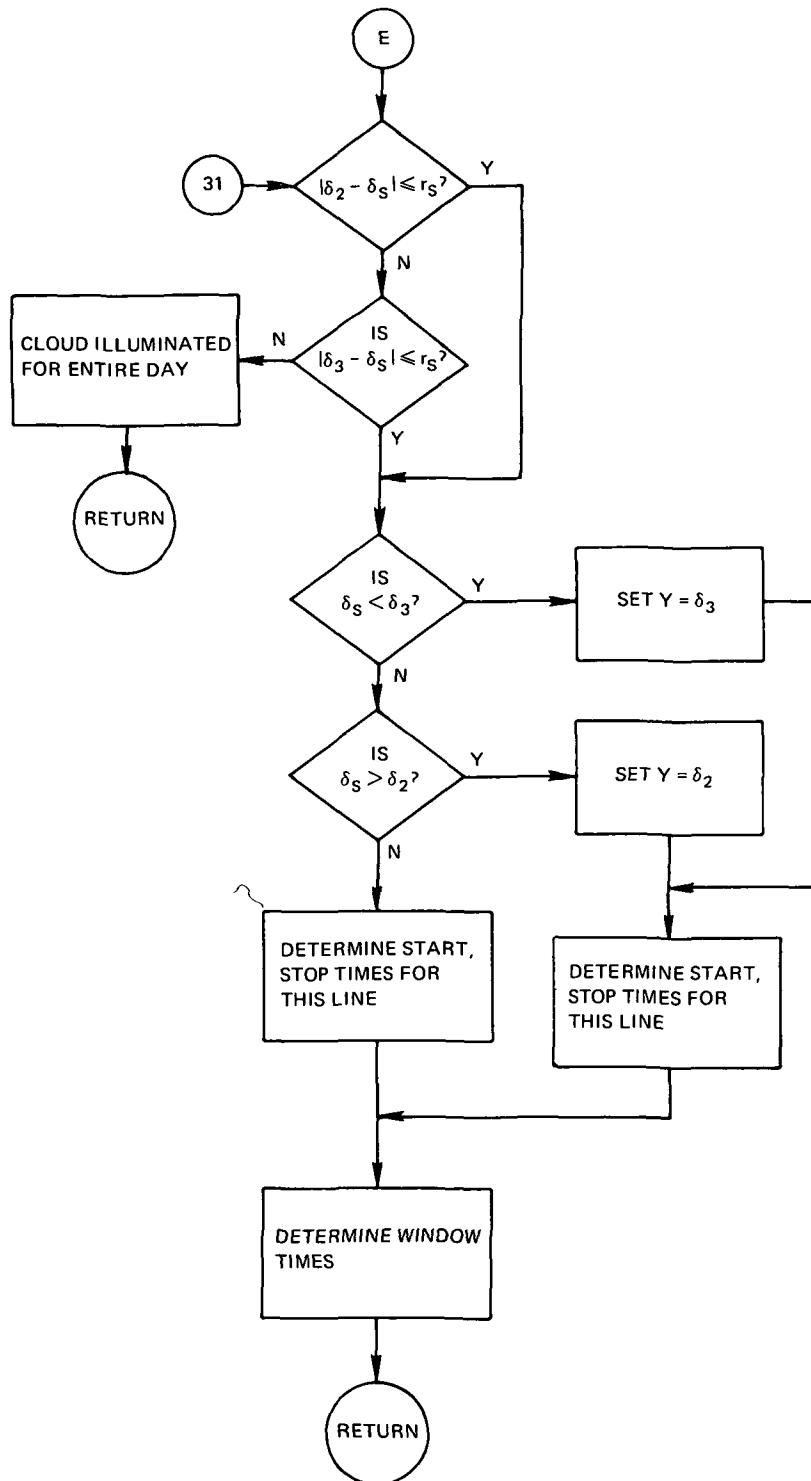












*****SUBROUTINE LIN1*****

*****NASA Wallops version of 08/01/71

*****LANGUAGE=FORTRAN IV

*****MACHINE=HW625

*****PURPOSE-

TO CALCULATE THE POSSIBLE RELEASE TIMES FOR THE CLOUD
ILLUMINATION CONSTRAINT.

*****METHOD-

THIS SUBROUTINE IS USED TO SOLVE THE POSSIBLE RELEASE TIME
CALCULATIONS AS DEFINED IN SUBROUTINE ILLUM USING AN EQUATION
THAT IS COMMON TO MANY CASES OF THE PROBLEM; THIS ROUTINE IS
USED TO SIMPLIFY THE MANIPULATIONS OF SUBROUTINE ILLUM,

*****INPUT-

| | |
|--------|--|
| XO | -RIGHT ASCENSION OF EARTH SHADOW CENTER (RADIAN) |
| YO | -DECLINATION OF EARTH SHADOW CENTER (RADIAN) |
| SHADOW | -RADIUS OF EARTH SHADOW REGION (RADIAN) |
| GHA | -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS -UNIVERSAL TIME (HRS) |
| DGHA | -HOURLY CHANGE FOR SIDEREAL TIME |
| RTH | -CONVERSION FACTOR FROM RADIAN TO HOURS |
| RLAMDA | -LONGITUDE OF RELEASE POINT (RADIAN) |
| PHI | -DECLINATION OF INTERSECTING POINT FOR CASE IN -QUESTION (RADIAN) |
| C | -APPLICABLE CONSTANT FOR CLOUD DRIFT (RADIAN/HR) |

*****OUTPUT-

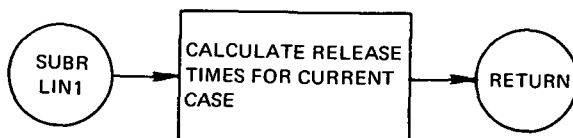
| | |
|----|--|
| T1 | -POSSIBLE TIME OF RELEASE FOR CASE IN QUESTION(HR) |
| T2 | -POSSIBLE TIME OF RELEASE FOR CASE IN QUESTION(HR) |

*****SUBPROGRAMS REQUIRED-

NONE

*****RESTRICTIONS-

NONE KNOWN



SUBROUTINE RDEPH(YEAR, DAY, ET, ANS)

NASA/WALLQPS VERSION OF 01/01/69

LANGUAGE = FORTRAN IV

MACHINE = GE 625

PURPOSE

RDEPH COMPUTES THE SUN AND MOON'S POSITION VECTOR

METHOD

THIS ROUTINE USES A THIRD DEGREE POLYNOMIAL TO INTERPOLATE TO A DESIRED ACCURACY OF APPROXIMATELY 5 ARC SECONDS

RESTRICTIONS

EPOCHERIS DATA IS PRESENTLY AVAILABLE FOR THE YEARS 1972-1980

CALLING SEQUENCE

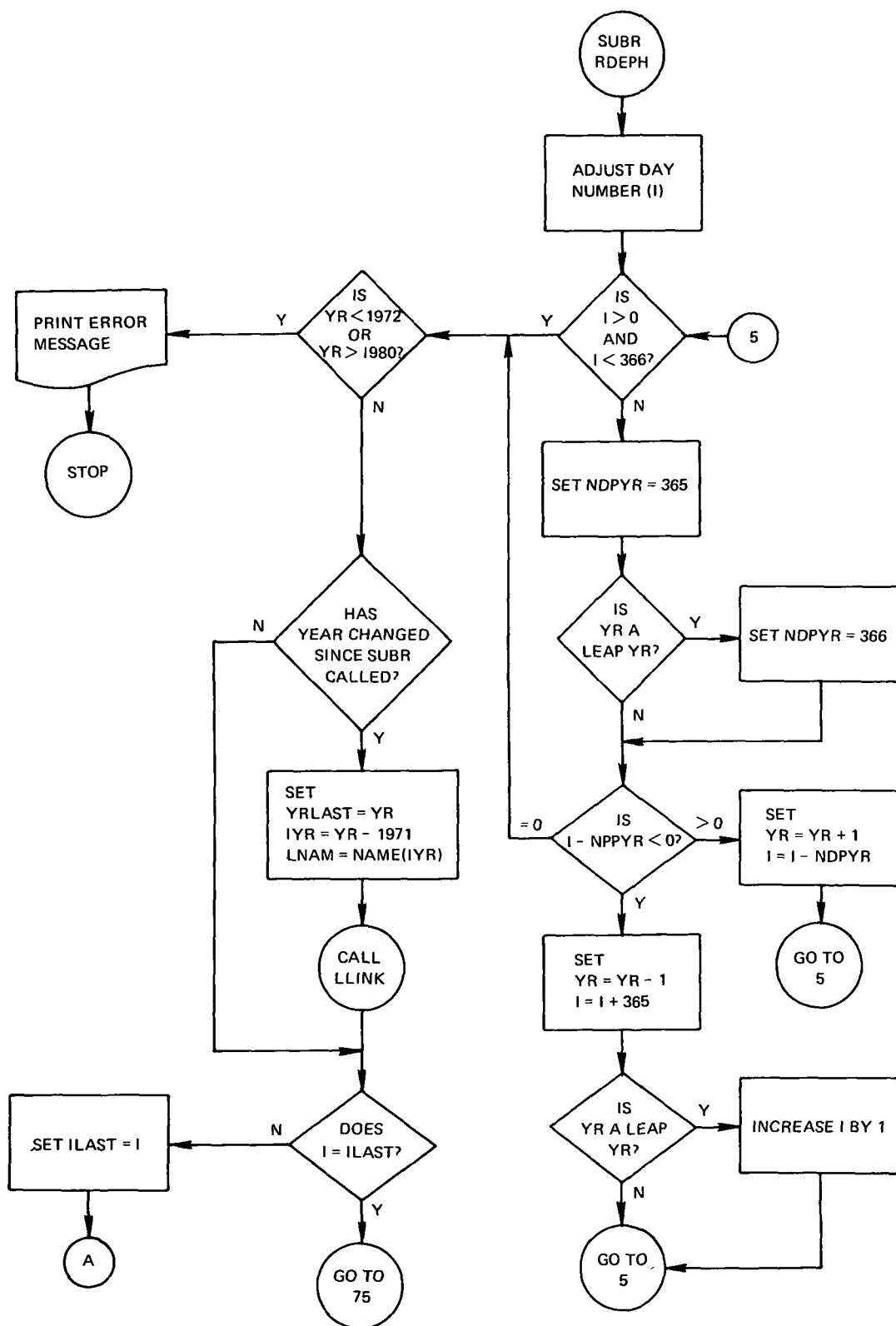
CALL RDEPH(YEAR, DAY, ET, ANS)

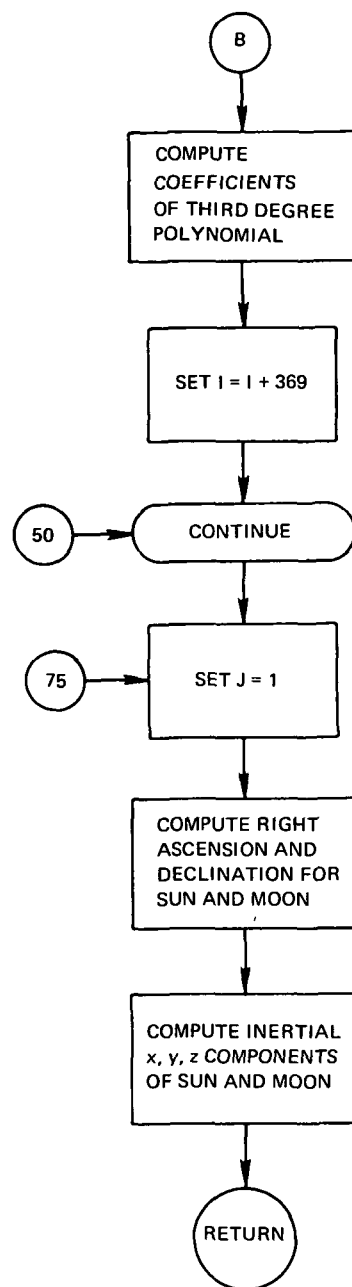
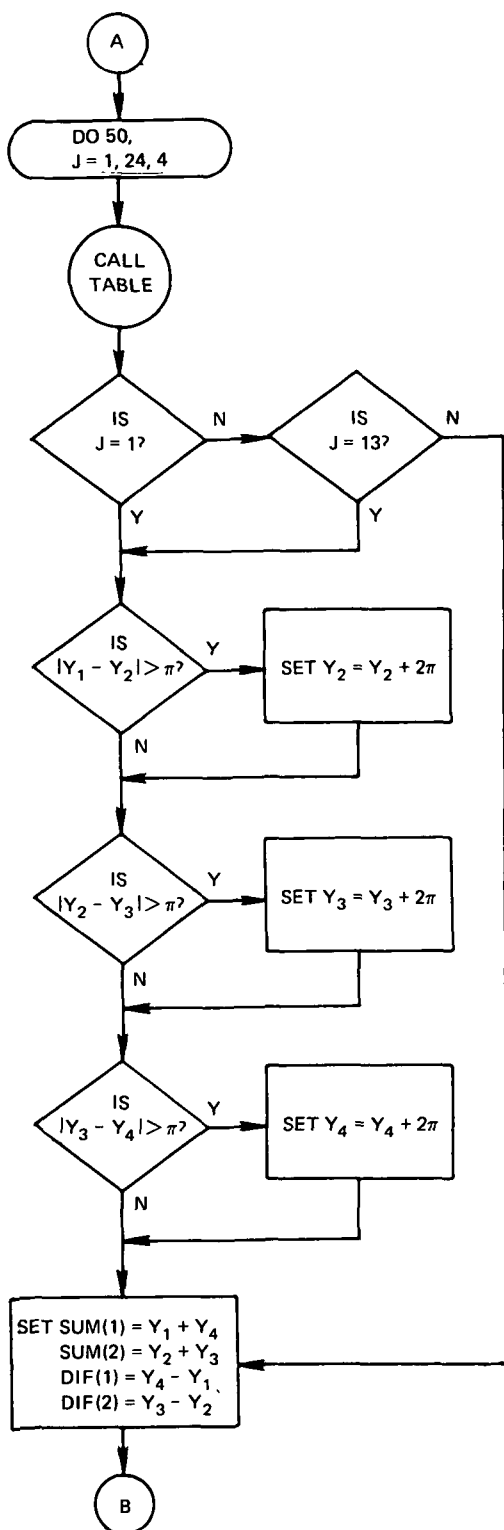
INPUT

YEAR = THE YEAR NUMBER
 DAY = THE DAY OF YEAR
 ET = THE EPHEMERIS TIME PAST THE EPOCH DATE (HOURS)

OUTPUT

ANS(1) = THE SUN'S RIGHT ASCENSION (RADIAN)
 ANS(2) = THE SUN'S DECLINATION (RADIAN)
 ANS(3) = THE SUN'S RADIUS VECTOR (A.U.)
 ANS(4-6) = THE INERTIAL X, Y, Z COORDINATES OF THE SUN (AU)
 ANS(7) = THE MOON'S RIGHT ASCENSION (RADIAN)
 ANS(8) = THE MOON'S DECLINATION (RADIAN)
 ANS(9) = THE MOON'S RADIUS VECTOR (EARTH RADIUS)
 ANS(10-12) = THE INERTIAL X, Y, Z COORDINATES OF THE MOON (ER)
 SUBPROGRAMS REQUIRED
 SUBROUTINE TABLE





*****NITE LITE *****

*****NASA WALLOPS VERSION OF 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE-GE 625

***** PURPOSE-

TO DETERMINE FROM DAILY TIME PERIODS, THAT PORTION OF THE STATED PERIOD FOR WHICH THE TOTAL SKY BACKGROUND BRIGHTNESS OF THE TARGET AS SEEN FROM A GIVEN TRACKING STATION WILL BE LOWER THAN THE STATED CONSTRAINT;

*****METHOD-

THIS SET OF SUBPROGRAMS DETERMINES THE TOTAL SKY BACKGROUND BRIGHTNESS FOR DISCRETE UNIVERSAL TIMES OF THE CURRENT DAY, CHECKS ARE MADE EACH TIME THE TOTAL SKY BACKGROUND BRIGHTNESS IS CALCULATED TO DETERMINE IF THE GIVEN VALUE OF THIS CONSTRAINT HAS BEEN EXCEEDED OR NOT, INTEGER VARIABLES N,M,L ARE USED TO RECORD THESE EVENTS, FOR THE EVENT THAT THE CONSTRAINT IS EXCEEDED, THE PROPER VARIABLE N,M,L IS GIVEN A VALUE OF ONE, IF THE CONSTRAINT IS NOT EXCEEDED THEN THE PROPER INTEGER VARIABLE IS SET TO ZERO,

USING THE 'N' AND 'M' INTEGER VARIABLES, SUCCESSIVE POINTS ARE CALCULATED IN HALF HOUR TIME INCREMENTS UNTIL A CHANGE OF EVENT OCCURS (N NOT EQUAL TO M), THE 'N' MAINTAINS THE CODE OF WHAT THE CHANGE IN EVENT IS, FROM, THE 'L' VARIABLE RECORDS THE EVENT OF THE CALCULATION PERFORMED AT A TIME BETWEEN THOSE OF EVENTS 'N' AND 'M', THE CALCULATION FOR THE 'L' EVENT THEN REPLACES THOSE OF EITHER THE 'N' OR 'M' EVENT, WHICHEVER IS THE SAME AS THE 'L' EVENT, THIS PROCESS IS REPEATED UNTIL THE ROUTINE CONVERGES TO THE TIME OF EVENT CHANGE WITH AN ACCURACY OF .008 HOURS,

THESE TIMES FOUND ARE THEN THE START/STOP RELEASE TIME INTERVALS FOR SATISFYING THE TOTAL SKY BRIGHTNESS CONSTRAINT FOR A GIVEN STATION ON A GIVEN DAY,

IN ADDITION, IF THE EVENT RECORDED FOR A GIVEN UNIVERSAL TIME IS ZERO (A GOOD RELEASE TIME), THE SUBROUTINE 'TRACK' CHECKS TO MAKE SURE THE CONSTRAINT IS NOT EXCEEDED DURING THE EXPERIMENTAL PERIOD. IF THE BRIGHTNESS CONSTRAINT IS EXCEEDED DURING THE EXPERIMENTAL PERIOD, THEN THE UNIVERSAL TIME RECORDED IS CONSIDERED AS NOT FAVORABLE AND THE EVENT CODE FOR THAT TIME IS CHANGED TO ONE,

*****INPUT-

| | |
|----------|--|
| NS | -THE NUMBER OF STATIONS USED IN THE PROGRAM |
| NOS(12) | -AN ARRAY CONTAINING THE STATION NUMBERS USED |
| R(5) | -INPUT VALUE FOR TOTAL SKY BACKGROUND BRIGHTNESS -(RAYLEIGHS) |
| R(7) | -MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS) |
| BA(12,7) | -AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE |

-GIVEN POSITION OF THE CLOUD (RAYLEIGHS)
 C(12,7) -COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION
 -OF THE TRACKING STATION TO THE CLOUD AND USED TO
 -SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS
 LD -ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY
 -(RAYLEIGHS)
 ST -UNRESOLVED STAR BRIGHTNESS OF A POINT IN THE SKY
 -(RAYLEIGHS)

***** OUTPUT-

WINDOW(6,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES;
 -1ST INDEX FOR STORING START/STOP TIMES,
 -1,3,5 FOR START TIMES
 -2,4,6 FOR STOP TIMES
 -2ND INDEX FOR THE CONSTRAINT
 - 5=TOTAL SKY BACKGROUND BRIGHTNESS
 -3RD INDEX FOR THE STATION NUMBER

*****RESTRICTIONS-

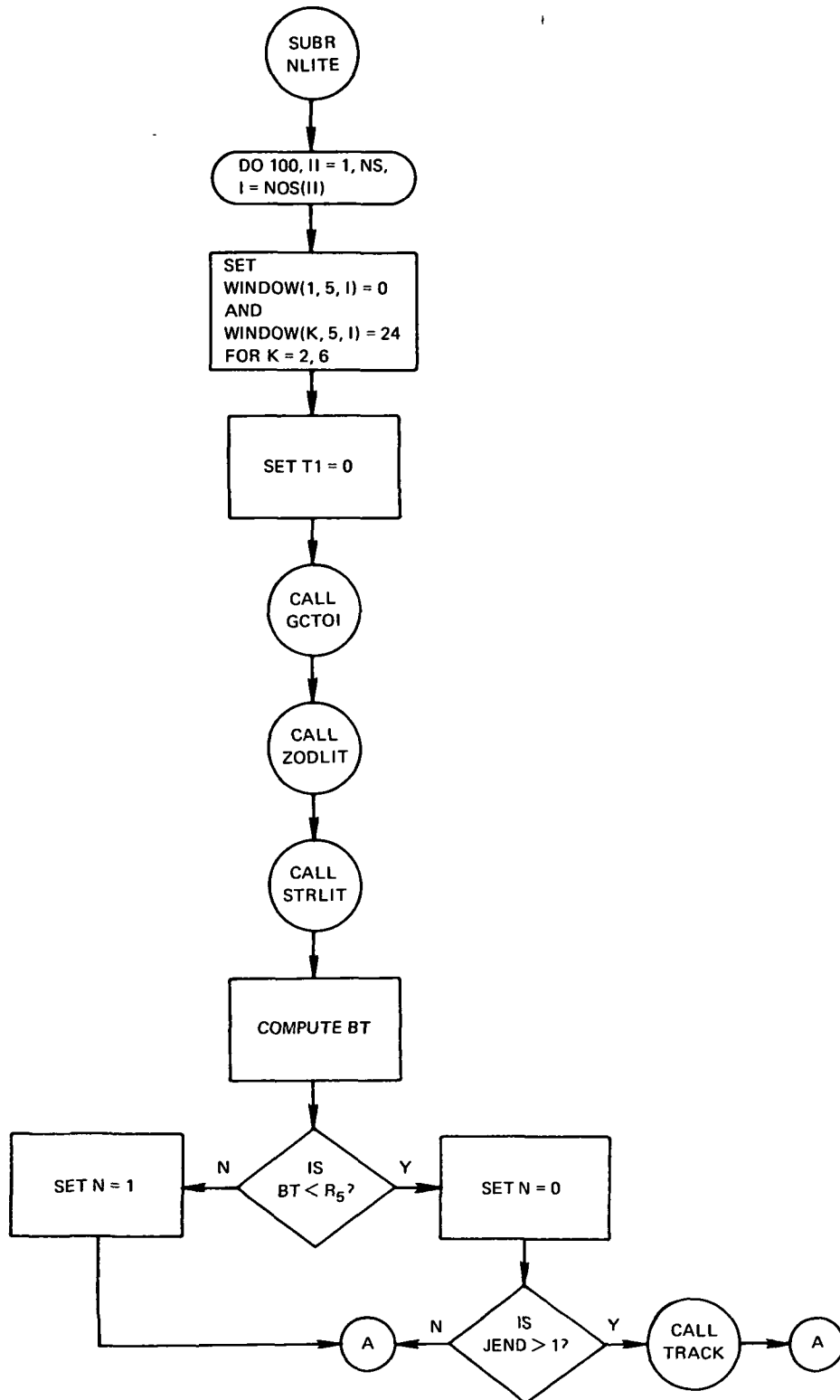
TSTOP MUST BE NUMERICALLY GREATER THAN TSTART, ONLY TWELVE
 STATIONS MAY BE USED, TSTOP AND TSTART ARE ACCURATE TO ONE
 MINUTE OF TIME,

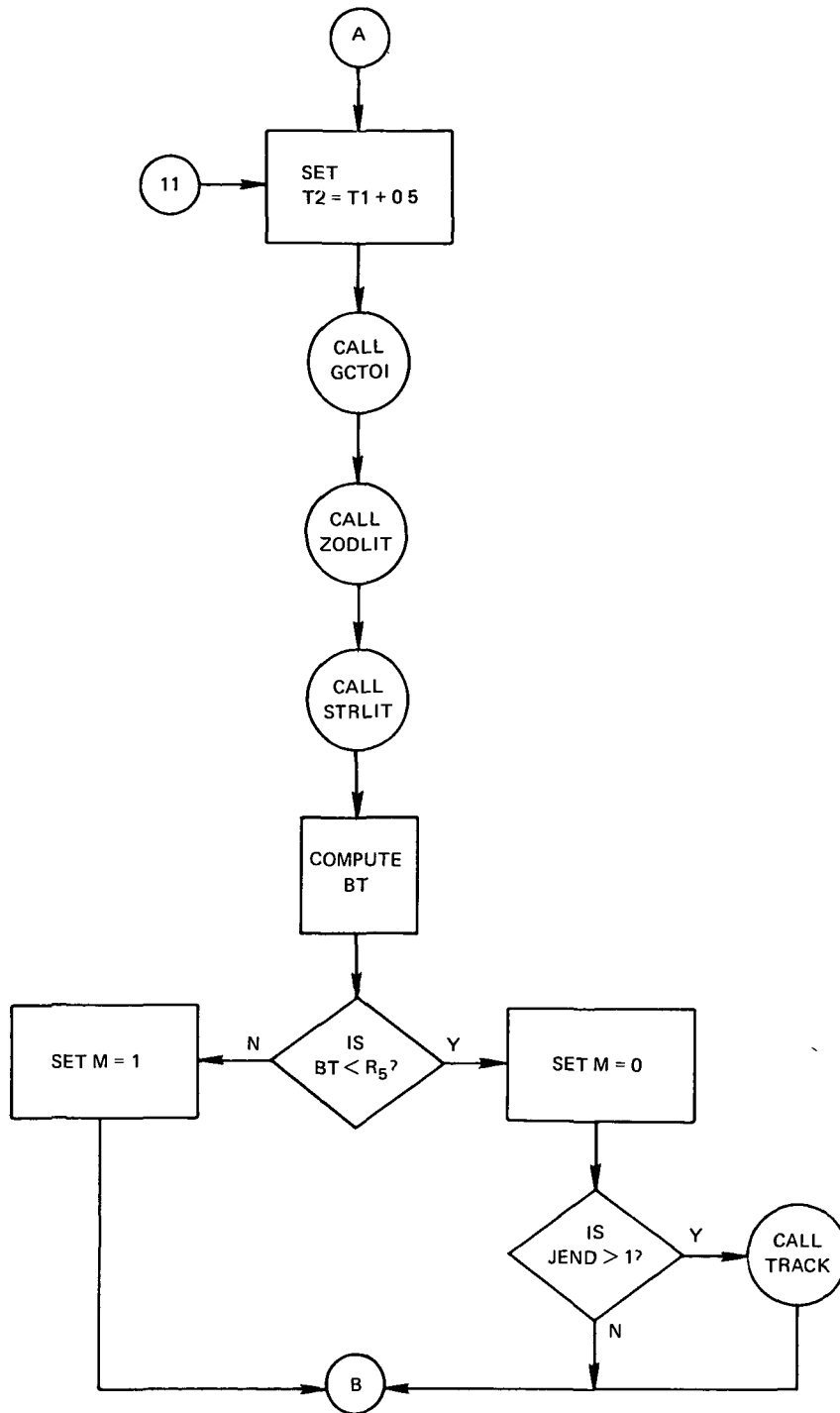
*****SUBPROGRAMS REQUIRED-

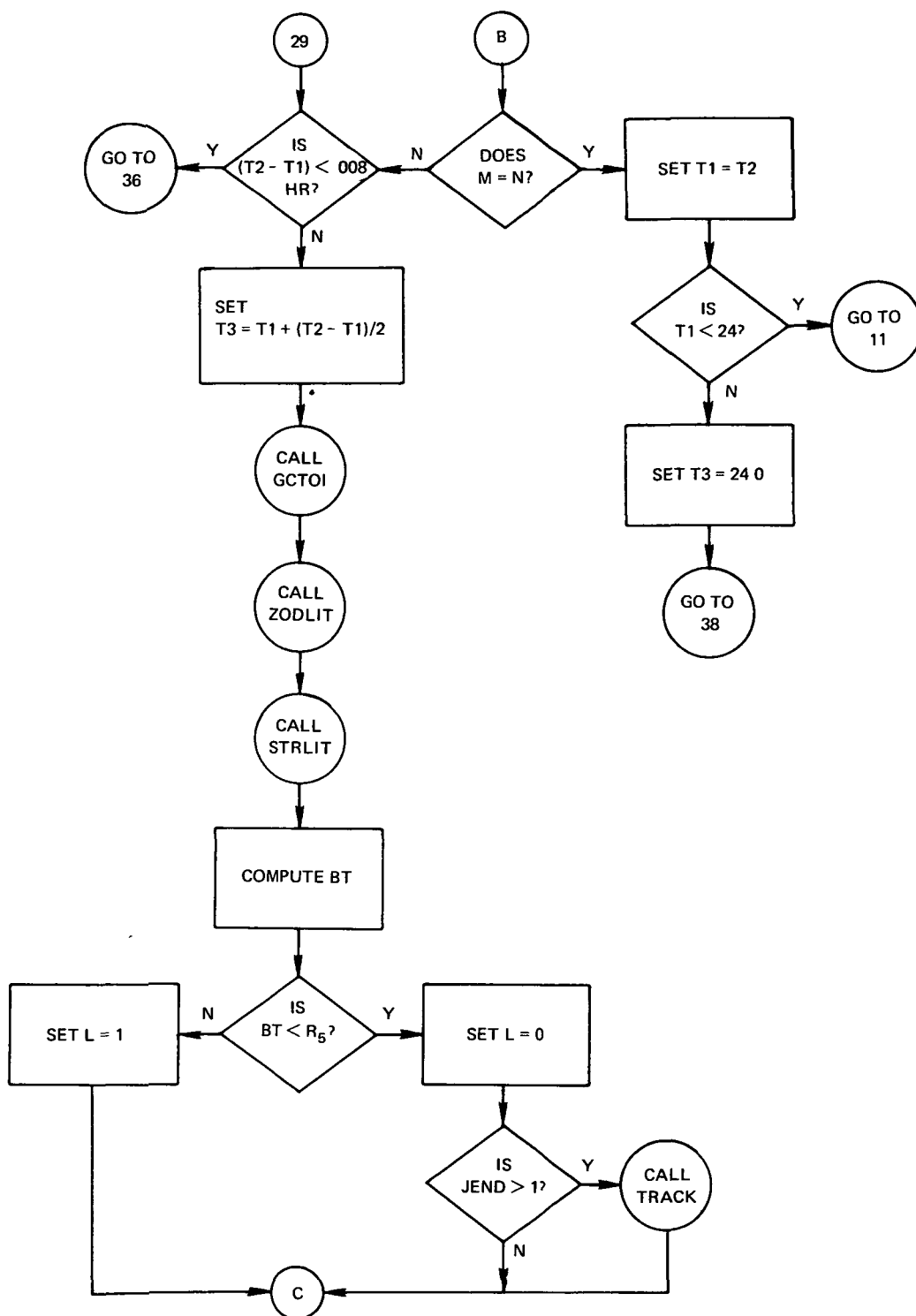
GCTOI
 ZODLIT
 ITE
 ZTABLE
 STRLIT
 TRACK

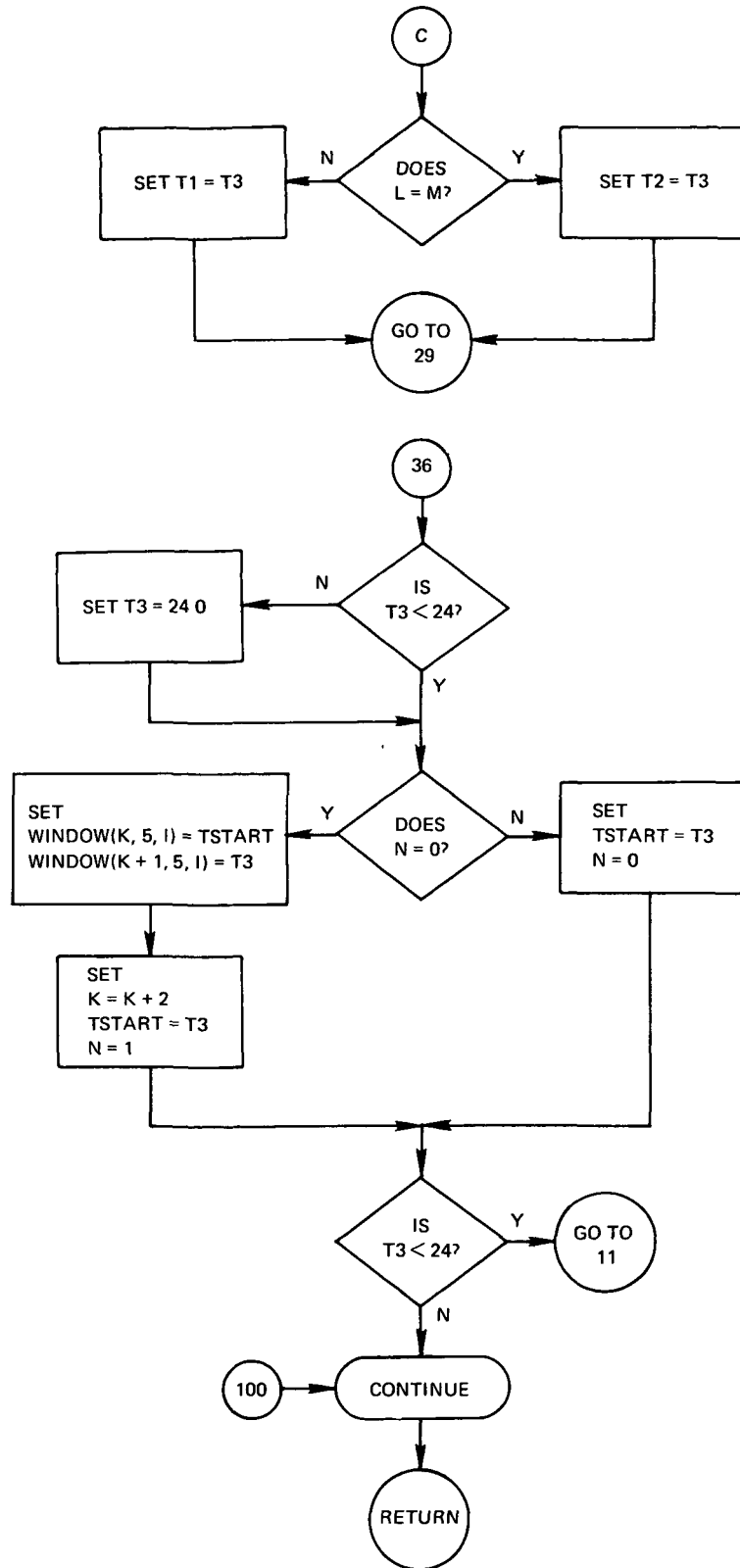
*****REMARK-

ONLY ELEVEN TRACKING STATIONS CAN BE USED AS INPUT IF ONE OF
 THESE STATIONS IS AN AIRCRAFT,









***** SUBROUTINE GCTOI *****

*****NASA Wallops version of 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

***** PURPOSE-

TO CONVERT GEOCENTRIC COORDINATES TO INERTIAL COORDINATES.

*****METHOD-

FIRST THE SIN AND COS OF THE GREENWICH MEAN SIDERIAL HOUR ANGLE IS CALCULATED FOR THE SPECIFIC TIME IN QUESTION, THESE VALUES ARE THEN USED TO CONVERT THE GEOCENTRIC COORDINATES TO INERTIAL

*****INPUT-

| | |
|------|--|
| GHA | -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS -UNIVERSAL TIME (HRS) |
| WX | -GEOCENTRIC X COMPONENT OF INPUT VECTOR |
| WY | -GEOCENTRIC Y COMPONENT OF INPUT VECTOR |
| WZ | -GEOCENTRIC Z COMPONENT OF INPUT VECTOR |
| T | -CURRENT UNIVERSAL TIME (HOURS) |
| I | -TRACKING STATION NUMBER |
| HTR | -CONVERSION FROM HOURS TO RADIANS |
| DGHA | -HOURLY CHANGE FOR SIDERIAL TIME |

***** OUTPUT-

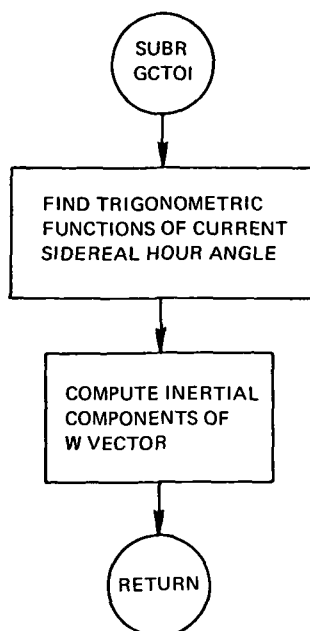
| | |
|----|--|
| W1 | -INERTIAL X COMPONENT OF OUTPUT VECTOR |
| W2 | -INERTIAL Y COMPONENT OF OUTPUT VECTOR |
| W3 | -INERTIAL Z COMPONENT OF OUTPUT VECTOR |

*****RESTRICTIONS-

NONE KNOWN

*****SUBPROGRAMS REQUIRED-

NONE



***** SUBROUTINE ZDZLIT *****

*****NASA Wallops version of 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

***** PURPOSE-
TO CALCULATE THE ZODIACAL LIGHT FOR A GIVEN SET OF LOOK
COORDINATES

*****METHOD-
FIRST SUBROUTINE ITE IS CALLED AND THE INERTIAL COORDINATES
OF THE VECTOR FROM THE STATION TO THE TEST CLOUD ARE CONVERTED
TO AN ECLIPTIC LATITUDE AND LONGITUDE; THE ECLIPTIC LATITUDE
AND LONGITUDE ARE THEN MADE ABSOLUTE VALUES; SUBROUTINE ZTABLE
IS THEN CALLED TO TRANSLATE THESE VALUES INTO ZODIACAL LIGHT
VALUES IN RAYLEIGHs

*****INPUT-

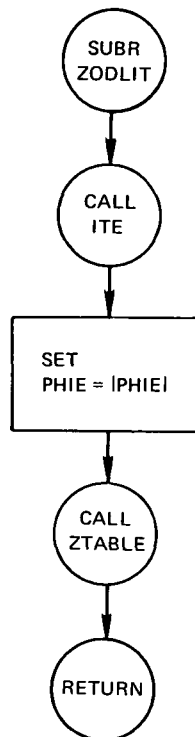
| | |
|----|--|
| W1 | -INERTIAL X COMPONENT OF VECTOR FROM STATION(I) -TO CLOUD |
| W2 | -INERTIAL Y COMPONENT OF VECTOR FROM STATION(I) -TO CLOUD |
| W3 | -INERTIAL Z COMPONENT OF VECTOR FROM STATION(I) -TO CLOUD |

***** OUTPUT-

| | |
|----|--|
| ZD | -ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY -(RAYLEIGHs) |
|----|--|

*****RESTRICTIONS-
NONE

*****SUBPROGRAMS REQUIRED=
ITE
ZTABLE



***** SUBROUTINE ITE *****

*****NASA Wallops version of 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE-GE 625

***** PURPOSE-

TO TRANSFORM FROM AN INERTIAL RECTANGULAR COORDINATE SYSTEM AS DESCRIBED IN USER DOCUMENTATION AND TO FIND THE ECLIPTIC LATITUDE AND ELONGATION OF A POINT OF INTERSECTION OF AN INPUT VECTOR WITH A CELESTIAL SPHERE;

*****METHOD-

ROTATION IS PERFORMED ON THE INERTIAL X,Y,Z COMPONENTS TO GIVE ECLIPTIC X,Y,Z, VALUES. THESE VALUES ARE USED TO CALCULATE THE ECLIPTIC LATITUDE AND LONGITUDE.

*****INPUT-

W1 -INERTIAL X COMPONENT OF VECTOR FROM STATION(I)
 -TO CLOUD

W2 -INERTIAL Y COMPONENT OF VECTOR FROM STATION(1)
 -TO CLOUD

W3 -INERTIAL Z COMPONENT OF VECTOR FROM STATION(1)
 -TO CLOUD

***** OUTPUT:

PHIE -ECLIPTIC LATITUDE (DEG)

OMEGAE -ECLIPTIC LONGITUDE (DEG)

*****INTERNAL PARAMETERS:

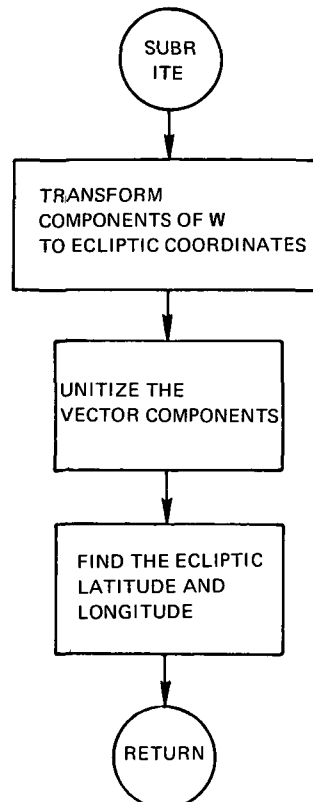
XE -X COMPONENT OF INPUT VECTOR IN ECLIPTIC
 -COORDINATES

YE -Y COMPONENT OF INPUT VECTOR IN ECLIPTIC
 -COORDINATES

ZE -Z COMPONENT OF INPUT VECTOR IN ECLIPTIC
 -COORDINATES

*****RESTRICTIONS=
NONE KNOWN

*****SUBPROGRAMS REQUIRED=
NONE



***** SUBROUTINE ZTABLE *****

*****NASA Wallops VERSION OF 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

***** PURPOSE=

TO FIND THE ZODIACAL LIGHT BRIGHTNESS AT A PARTICULAR POINT.

*****METHOD=

THIS IS A TABLE LOOKUP WITH DOUBLE INTERPOLATION,

*****INPUT=

PHIE -ECLIPTIC LATITUDE (DEG)

OMEGAE -ECLIPTIC LONGITUDE (DEG)

***** OUTPUT=

ZD -ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY
 -(RAYLEIGHS)

*****INTERNAL PARAMETERS=

P1 -ECLIPTIC LATITUDE FOR BRIGHTNESS AT POINT '1'

P2 -ECLIPTIC LATITUDE FOR BRIGHTNESS AT POINT '1+1'

Q1 -ECLIPTIC LONG. FOR BRIGHTNESS AT POINT '1'

Q2 -ECLIPTIC LONG. FOR BRIGHTNESS AT POINT '1+1'

ZD1 -VALUE OF ZODIACAL LIGHT AT (P1,QA)

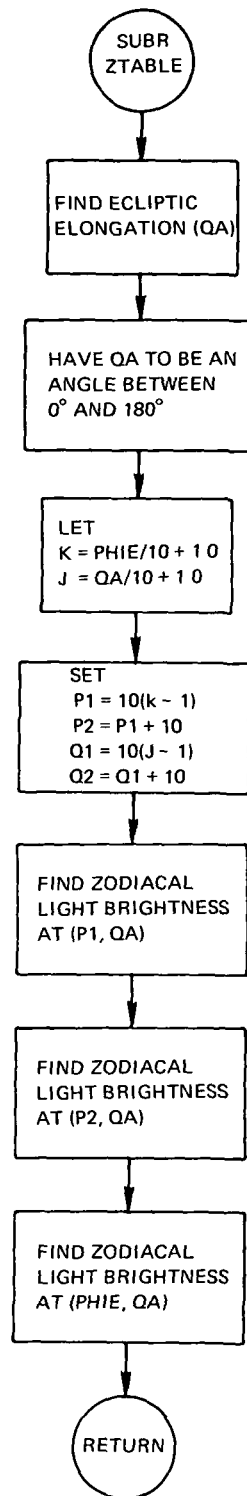
ZD2 -VALUE OF ZODIACAL LIGHT AT (P2,QA)

*****RESTRICTIONS=

NONE KNOWN

*****SUBPROGRAMS REQUIRED=

NONE



***** SUBROUTINE STRLIT *****

*****NASA Wallops version of 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

***** PURPOSE=

TO CALCULATE THE STAR LIGHT BRIGHTNESS AT A GIVEN SET OF LOOK
COORDINATES,

*****METHOD=

A TABLE LOOKUP PROCESS WITH LINEAR INTERPOLATION IS USED TO
DETERMINE THE VALUE OF THE STAR BRIGHTNESS OF THE SKY
BACKGROUND OF THE CLOUD AS SEEN FROM A GIVEN TRACKING STATION,
THE TABLE OF STAR BRIGHTNESS VALUES HAVE BEEN TRANSFORMED INTO
INERTIAL COORDINATES WITH UNITS OF TENTH VISUAL STAR MAGNITUDES
PER SQUARE DEGREE, BRIGHTNESS TABLES ARE GIVEN IN 5-DEGREE
INCREMENTS OF LATITUDE FROM -90 DEG. TO +90 DEG, AND IN 10-DEG,
INCREMENTS OF LONGITUDE FROM 0 TO 360 DEGREES,
LOOK ANGLES ARE FOUND FROM THE INERTIAL RECTANGULAR COMPONENTS
THEN TABLE LINEAR INTERPOLATION DETERMINES THE STAR BRIGHTNESS

*****INPUT=

| | |
|----|---|
| W1 | =INERTIAL X COMPONENT OF VECTOR FROM STATION(1) TO CLOUD |
| W2 | =INERTIAL Y COMPONENT OF VECTOR FROM STATION(1) TO CLOUD |
| W3 | =INERTIAL Z COMPONENT OF VECTOR FROM STATION(1) TO CLOUD |

***** OUTPUT=

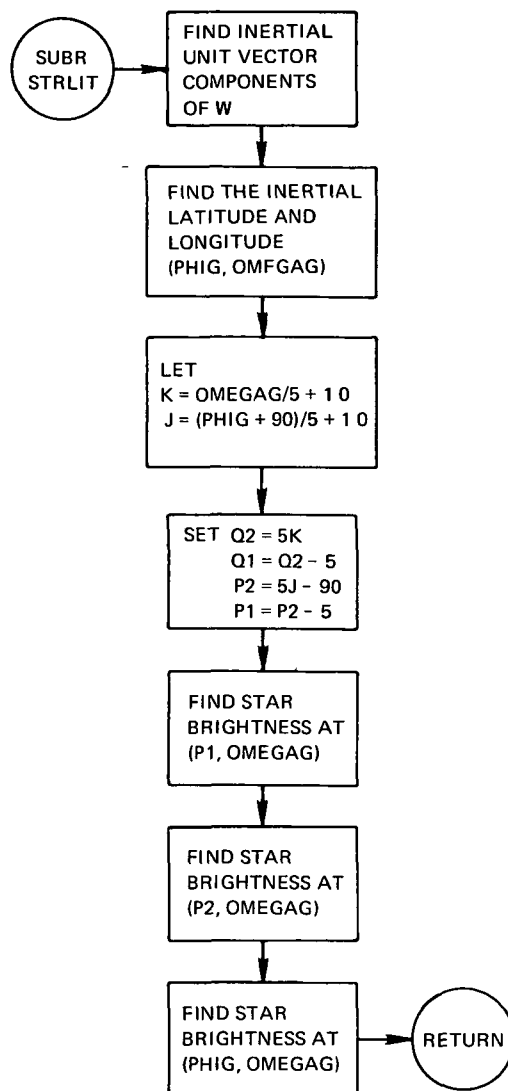
| | |
|----|---|
| ST | =UNRESOLVED STARLIGHT BRIGHTNESS OF A POINT IN THE SKY (RAYLEIGHs) |
|----|---|

*****RESTRICTIONS=

FORTAN MEMORY LIMITS MUST BE INCREASED TO 30K FOR COMPILING
THIS SUBROUTINE

*****SUBPROGRAMS REQUIRED=

NONE



*****SUBROUTINE TRACK*****

*****NASA Wallops version of 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

PURPOSE-

TO DETERMINE IF THE TOTAL SKY BACKGROUND BRIGHTNESS WILL EXCEED THE CONSTRAINT LIMITATION DURING THE REQUIRED EXPERIMENTAL PERIOD.

*****METHOD-

GIVEN A FAVORABLE TIME OF RELEASE FOR STATION(I) FROM SUBROUTINE NLITE, DETERMINE IF THE TOTAL SKY BACKGROUND BRIGHTNESS IS EXCEEDED DURING THE EXPERIMENTAL PERIOD BY CHECKING THIS AT 30 MINUTE INTERVALS, THE INERTIAL RECTANGULAR

COMPONENTS OF THE VECTOR FROM STATION(I) TO THE CLOUD,S POSITION DURING THE EXPERIMENTAL PERIOD ARE FIRST CALCULATED. THE VALUES OF ZODIACAL LIGHT AND STARLIGHT ARE DETERMINED THROUGH SUBROUTINES ZODLIT AND STRLIT RESPECTIVELY, THEN THE TOTAL SKY BACKGROUND BRIGHTNESS IS CALCULATED USING THE RESPECTIVE VALUES OF AIRGLOW BRIGHTNESS AS FOUND IN SUBROUTINE EPAIR, THEN THE TOTAL SKY BACKGROUND BRIGHTNESS IS CHECKED AGAINST THE GIVEN CONSTRAINT, IF THE GIVEN CONSTRAINT IS EXCEEDED AT ANY POINT CHECKED, THEN THE EVENT CODE 'N' IS SET TO ONE AND THE SUBROUTINE TERMINATES,

*****INPUT-

R(5) -INPUT VALUE FOR TOTAL SKY BACKGROUND BRIGHTNESS
 -(RAYLEIGHS)

GHA -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS
 -UNIVERSAL TIME (HRS)

BA(12,7) -AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE
 -GIVEN POSITION OF THE CLOUD (RAYLEIGHS)

C(12,7) -COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION
 -OF THE TRACKING STATION TO THE CLOUD AND USED TO
 -SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS

JEND -NUMBER OF DISCRETE VALUES STORED FOR
 -EXPERIMENTAL PERIOD DATA

ZD -ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY
 -(RAYLEIGHS)

ST -UNRESOLVED STAR BRIGHTNESS OF A POINT IN THE SKY
 -(RAYLEIGHS)

WPX(12,7) -VALUE OF GEOCENTRIC X COMPONENT OF VECTOR FROM
 -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE

WPY(12,7) -VALUE OF GEOCENTRIC Y COMPONENT OF VECTOR FROM
 -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE

WPZ(12,7) -VALUE OF GEOCENTRIC Z COMPONENT OF VECTOR FROM
 -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE

T -PRESENT UNIVERSAL TIME FOR RELEASE

I -STATION NUMBER

*****OUTPUT-

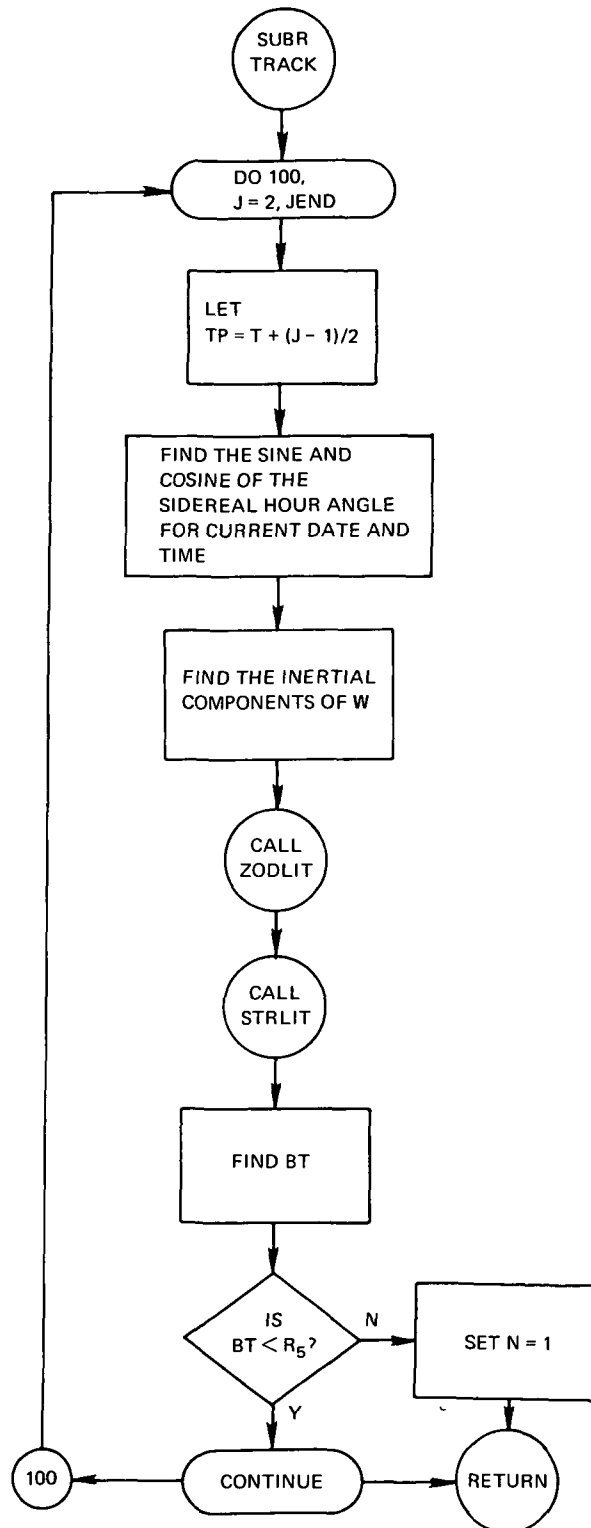
N -EVENT CODE
 - =0, IF BT,LT,R(5)
 - =1, IF BT,GT,R(5)

*****RESTRICTIONS-

THIS SUBROUTINE ACCEPTS UP TO A MAXIMUM OF TWELVE TRACKING STATIONS AND COMPUTES A MAXIMUM OF SEVEN DISCRETE POINTS AT 30 MINUTE INTERVALS DURING THE EXPERIMENTAL PERIOD,

*****SUBPROGRAMS REQUIRED-

ZODLIT
 ITE
 ZTABLE
STRLIT



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*****SUBROUTINE DJT1*****
*****NASA Wallops version of 02/01/70
*****LANGUAGE=FORTRAN IV
*****MACHINE=GE 625
*****PURPOSE=
    TO WRITE THE DAILY RELEASE TIMES PER CONSTRAINT PER STATION ON
    OUTPUT FILE 07,
*****METHOD=
    GIVEN THE PROPER CONSTRAINT INDEX NUMBER, WRITE THE CONSTRAINT
    INDEX NUMBER, THE CURRENT DATE, THE CONSTRAINT NAME, THE STATION
    NAME (IF NOT EARTH SHADOW CONSTRAINT); THE CALCULATED RELEASE
    START/STOP TIMES, AND THE STATION NUMBER IN PROPER BCD FORMAT TO
    INSURE CORRECT PRINTING IN SUBROUTINE OUTPUT,
*****INPUT=
    K          =INDEX FOR CONSTRAINTS
               =1; EARTH SHADOW
               =2; NOT USED
               =3; SUN
               =4; MOON
               =5; TOTAL SKY BACKGROUND BRIGHTNESS
    DJUL       =JULIAN DATE FOR CURRENT DATA
    WINDOW(6,5,12)=THE DAILY RELEASE WINDOW START/STOP TIMES,
                   =1ST INDEX FOR STORING START/STOP TIMES,
                   =1,3,5 FOR START TIMES
                   =2,4,6 FOR STOP TIMES
                   =2ND INDEX FOR THE CONSTRAINT
                   = 1=EARTH SHADOW
                   = 2=ELEVATION
                   = 3=SUN
                   = 4=MOON
                   = 5=TOTAL SKY BACKGROUND BRIGHTNESS
    NS         =THE NUMBER OF STATIONS USED IN THE PROGRAM
    NOS(12)    =AN ARRAY CONTAINING THE STATION NUMBERS USED
*****OUTPUT=
    ON FILE 07
    K          =INDEX FOR CONSTRAINTS
               =1; EARTH SHADOW
               =2; NOT USED
               =3; SUN
               =4; MOON
               =5; TOTAL SKY BACKGROUND BRIGHTNESS
    IDAY       =DAY NUMBER FOR DATE OF CURRENT DATA
    IMONTH     =MONTH FOR DATE OF CURRENT DATA
    MONTH      =NAME OF MONTH CORRESPONDING TO IMONTH
    IYEAR      =YEAR FOR DATE OF CURRENT DATA
    NRESTR(3)  =ALPHANUMERIC NAME OF CONSTRAINT

```

NAME(3,12) -NAME OF TRACKING STATIONS USED

WINDOW(6,5,12) -THE DAILY RELEASE WINDOW START/STOP TIMES,
 -1ST INDEX FOR STORING START/STOP TIMES,
 -1,3,5 FOR START TIMES
 -2,4,6 FOR STOP TIMES
 -2ND INDEX FOR THE CONSTRAINT
 - 1=EARTH SHADOW
 - 2=ELEVATION
 - 3=SUN
 - 4=MOON
 - 5=TOTAL SKY BACKGROUND BRIGHTNESS

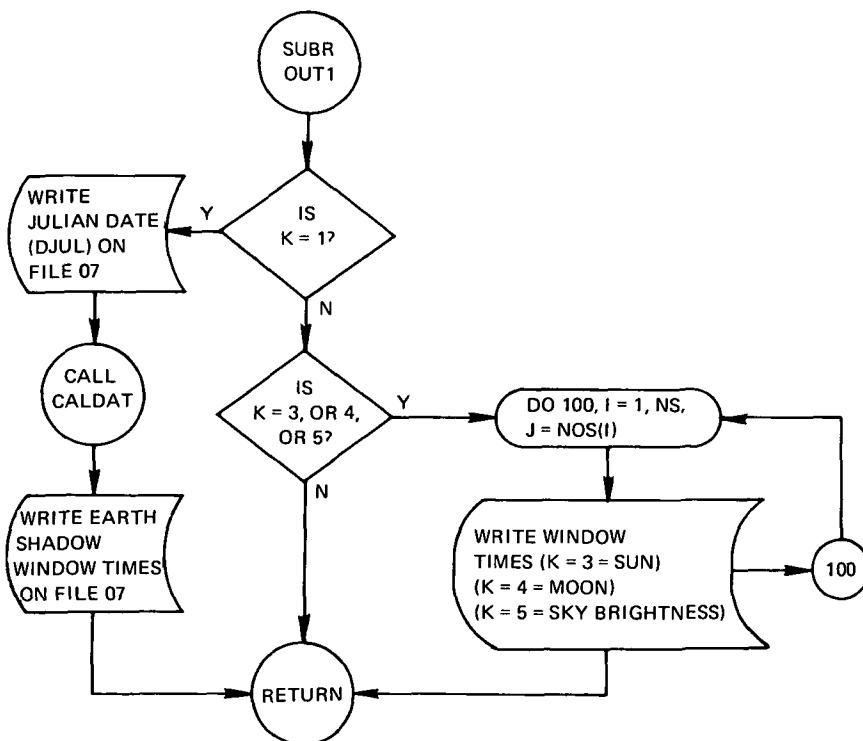
J -CODE TO SUBROUTINE OUTPTE TO SIGNAL THAT STATION
 -BEING READ IS FIRST ONE FOR THAT PARTICULAR
 -CONSTRAINT OR IT IS NOT

*****RESTRICTIONS-

THIS SUBROUTINE IS SPECIFICALLY DESIGNED FOR PRINTING THE
 PARAMETERS GENERATED BY THE CURRENT VERSION OF PROGRAM
 'BICWINDOW'

*****SUBPROGRAMS REQUIRED-

CALDAT



*****SUBROUTINE CALDAY*****

*****NASA WOLLOPS VERSION OF 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

*****PURPOSE-

TO FIND THE DATE OF THE CURRENT DAY

*****METHOD-

GIVEN THE YEAR FOR WHICH THE CALCULATIONS BEGIN (KYEAR), AND THE CURRENT NUMBER OF DAYS PAST JANUARY 0 OF THE GIVEN YEAR (IDAY), FIRST DETERMINE IF THE GIVEN YEAR IS THE CURRENT YEAR BY DETERMINING IF 'IDAY' IS BETWEEN 0 AND 365 (366 IF 'KYEAR' IS A LEAP YEAR). THE CURRENT YEAR IS THEN STORED (IYEAR) AND ADJUSTMENT IS MADE TO 'IDAY' TO REFLECT THE NUMBER OF DAYS PAST JANUARY 0 OF 'IYEAR'. A TABLE OF VALUES IS GIVEN FOR THE NUMBER OF DAYS IN EACH MONTH (ADJUSTMENT MADE FOR FEBRUARY OF A LEAP YEAR). THE MONTH NUMBER IS THEN FOUND BY CHECKING AND ADJUSTING 'IDAY'.

*****INPUT-

KYEAR -YEAR NUMBER FOR STARTING CALCULATIONS
IDAY -CURRENT NUMBER OF DAYS PAST JANUARY 0 OF KYEAR

*****OUTPUT-

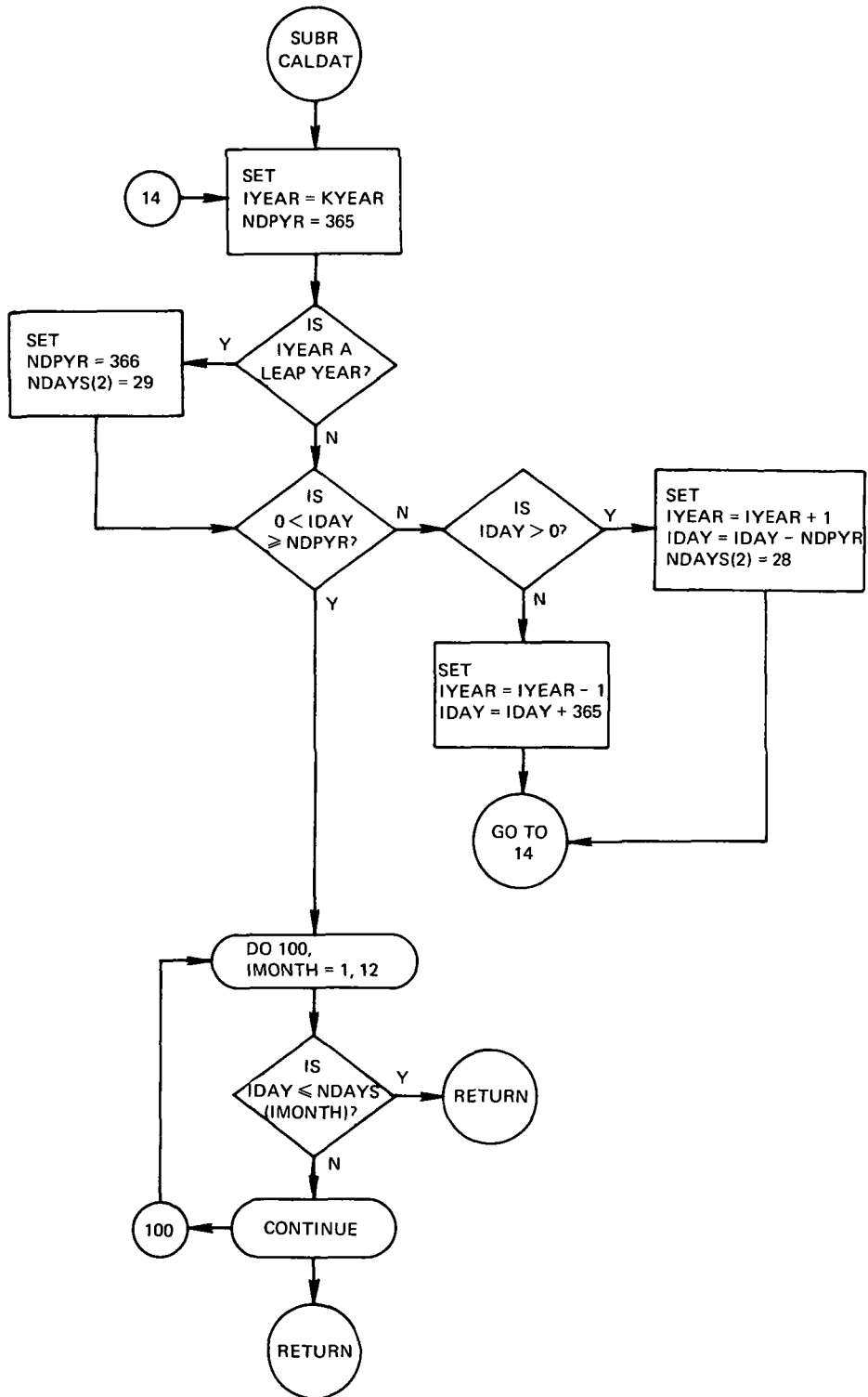
IYEAR -YEAR FOR DATE OF CURRENT DATA
IMONTH -MONTH FOR DATE OF CURRENT DATA
IDAY -DAY NUMBER FOR DATE OF CURRENT DATA

*****RESTRICTIONS-

THIS SUBROUTINE WILL COMPUTE THE YEAR, MONTH NUMBER, AND DAY FOR ANY YEAR EXCEPT THOSE YEARS FOR WHICH 'IYEAR/4' IS AN INTEGRAL VALUE BUT 'IYEAR' IS NOT A LEAP YEAR (I.E., THE YEAR 2000).

*****SUBROUTINES REQUIRED-

NONE



*****SUBROUTINE TTLNDO*****

*****NASA WOLLOPS VERSION OF 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

*****PURPOSE-

TO COMPUTE THE COMBINED DAILY RELEASE WINDOW FOR THE BIG PROJECT

*****METHOD-

GIVEN THE DAILY RELEASE WINDOWS AS CALCULATED FOR EACH STATION AND FOR EACH CONSTRAINT, THE RESULT OF THIS SUBROUTINE IS TO DEFINE TIME INTERVALS FOR THE CURRENT DAY WHICH SATISFY EACH OF THE GIVEN TIME INTERVALS ALREADY FOUND FOR EACH STATION AND FOR EACH CONSTRAINT, THE METHOD CAN BE DIVIDED INTO THREE PHASES. FIRST, FIND THE INTERSECTION OF THE DAILY RELEASE WINDOWS FOUND FOR THAT STATION FOR EACH CONSTRAINT, THOSE INTERSECTING INTERVALS FOUND ARE THEN STORED IN THE 'A' AND 'B' ARRAYS, SECOND, THE INTERSECTION OF THE TIME INTERVALS DEFINED IN THESE ARRAYS ARE THEN DETERMINED AND STORED IN 'C' AND 'D' ARRAYS, THIRD, THESE TIME INTERVALS ARE COMBINED WITH PREVIOUSLY COMPUTED CASES OF THIS JOB THRU SUBROUTINE ICAS, THESE ARE THEN STORED ON FILE 09 FOR PLOTTING AND/OR PRINTING,

*****INPUT-

NS -THE NUMBER OF STATIONS USED IN THE PROGRAM

NOS(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED

WINDOW(6,5,12)-THE DAILY RELEASE WINDOW START/STOP TIMES,
 -1ST INDEX FOR STORING START/STOP TIMES,
 -1,3,5 FOR START TIMES
 -2,4,6 FOR STOP TIMES
 -2ND INDEX FOR THE CONSTRAINT
 - 1=EARTH SHADOW
 - 2=ELEVATION
 - 3=SUN
 - 4=MOON
 - 5=TOTAL SKY BACKGROUND BRIGHTNESS

DJUL -JULIAN DATE FOR CURRENT DATA

NDPJU -NUMBER OF DAYS PAST EPOCH DATE TO DATE FOR
 -STARTING CALCULATIONS (INTEGER)

NDTE -NUMBER OF DAYS PAST EPOCH DATE TO DATE FOR
 -STOPPING CALCULATIONS (INTEGER)

ICASE -INTEGER VALUE OF CASE NUMBER

IFINAL -INTEGER CODE NOTING LAST CASE
 -=0; MORE CASES TO FOLLOW
 -=1; THIS IS THE FINAL CASE

I -CURRENT NUMBER OF DAYS FROM FIRST DAY CALCULATED

*****OUTPUT-

DJUL -JULIAN DATE FOR CURRENT DATA

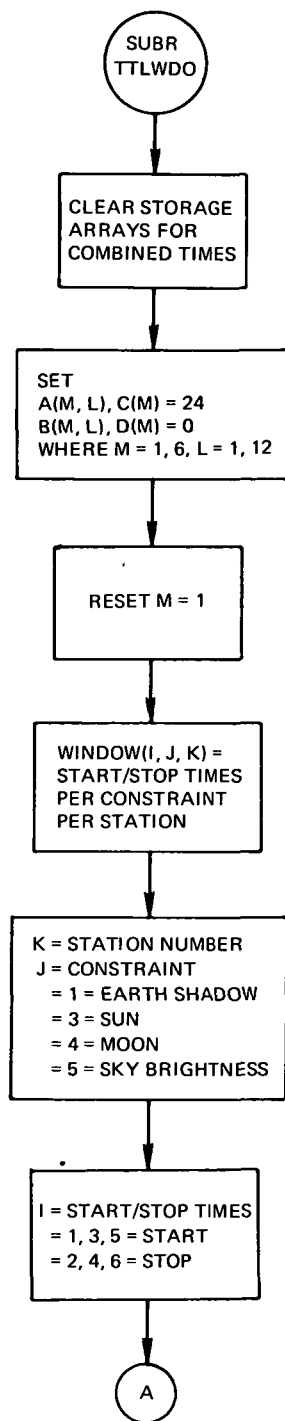
| | |
|--------|--|
| IYEAR | -YEAR FOR DATE OF CURRENT DATA |
| IMONTH | -MONTH FOR DATE OF CURRENT DATA |
| IDAY | -DAY NUMBER FOR DATE OF CURRENT DATA |
| C(6) | -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT -DATE |
| D(6) | -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT -DATE |
| E(6) | -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT -DATE FOR ALL INPUT CASES |
| F(6) | -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT -DATE FOR ALL INPUT CASES |

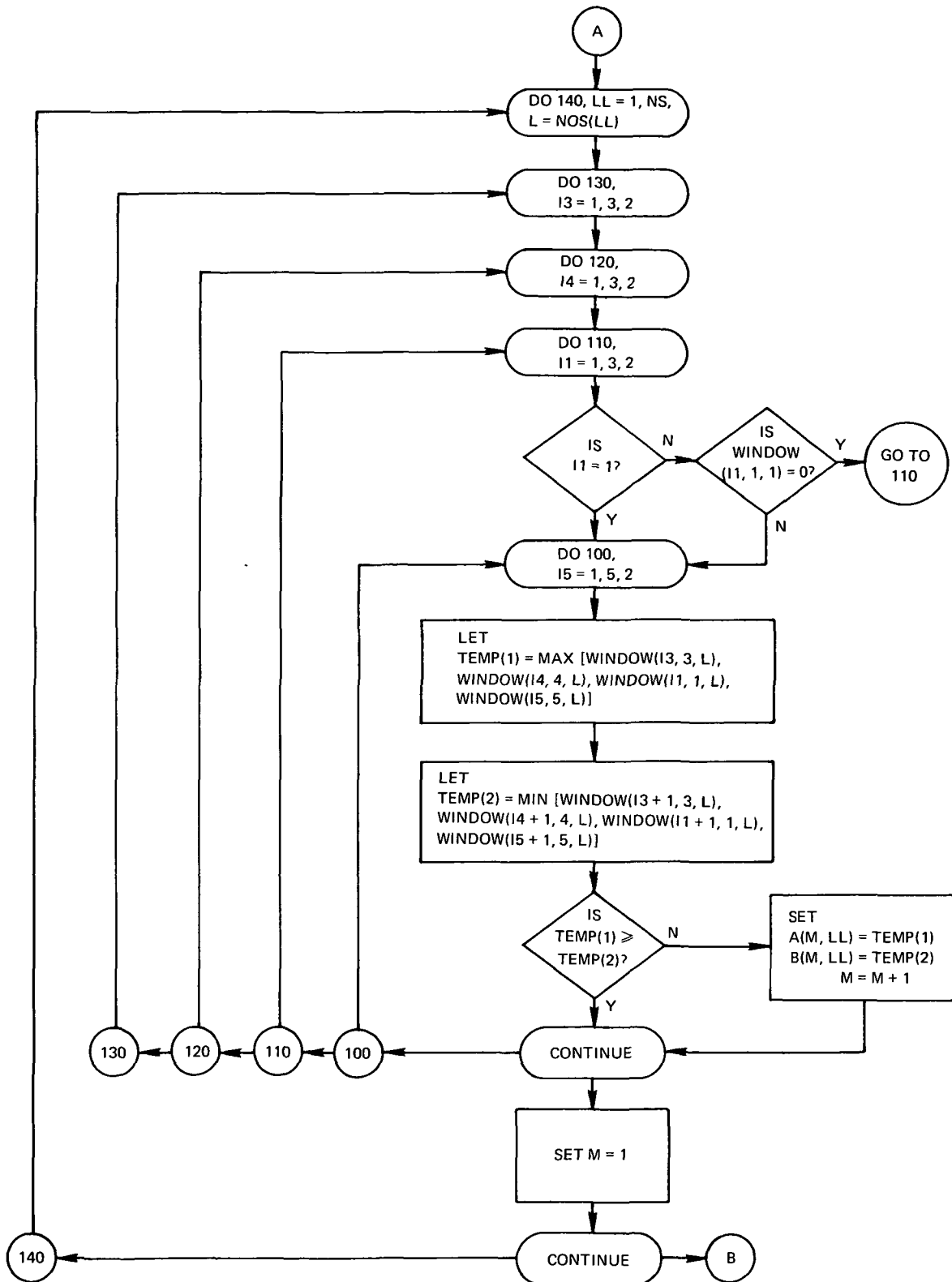
*****RESTRICTIONS-

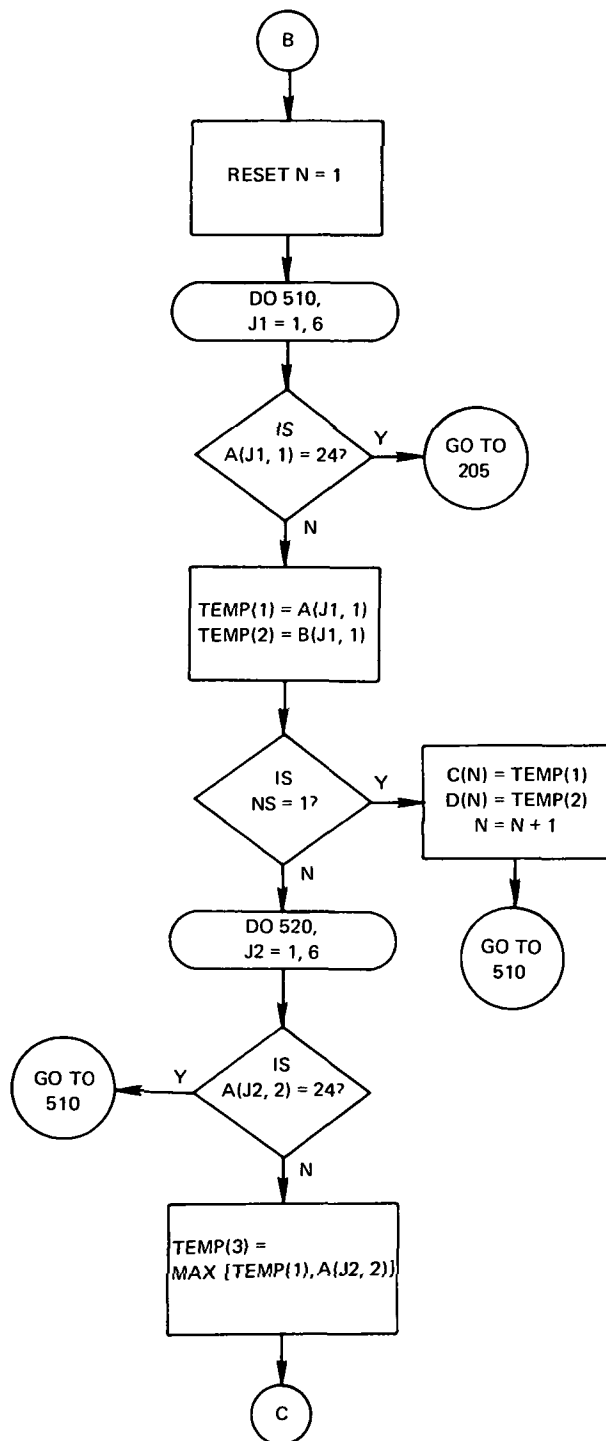
ONLY THOSE CONSTRAINTS AS CURRENTLY COMPUTED IN THE BICWINDOW
COMPUTER PROGRAM CAN BE COMBINED,
UP TO A MAXIMUM OF TWELVE TRACKING STATIONS CAN BE COMBINED,
A MAXIMUM OF SIX COMBINED INTERVALS CAN BE COMPUTED FOR A GIVEN
DAY

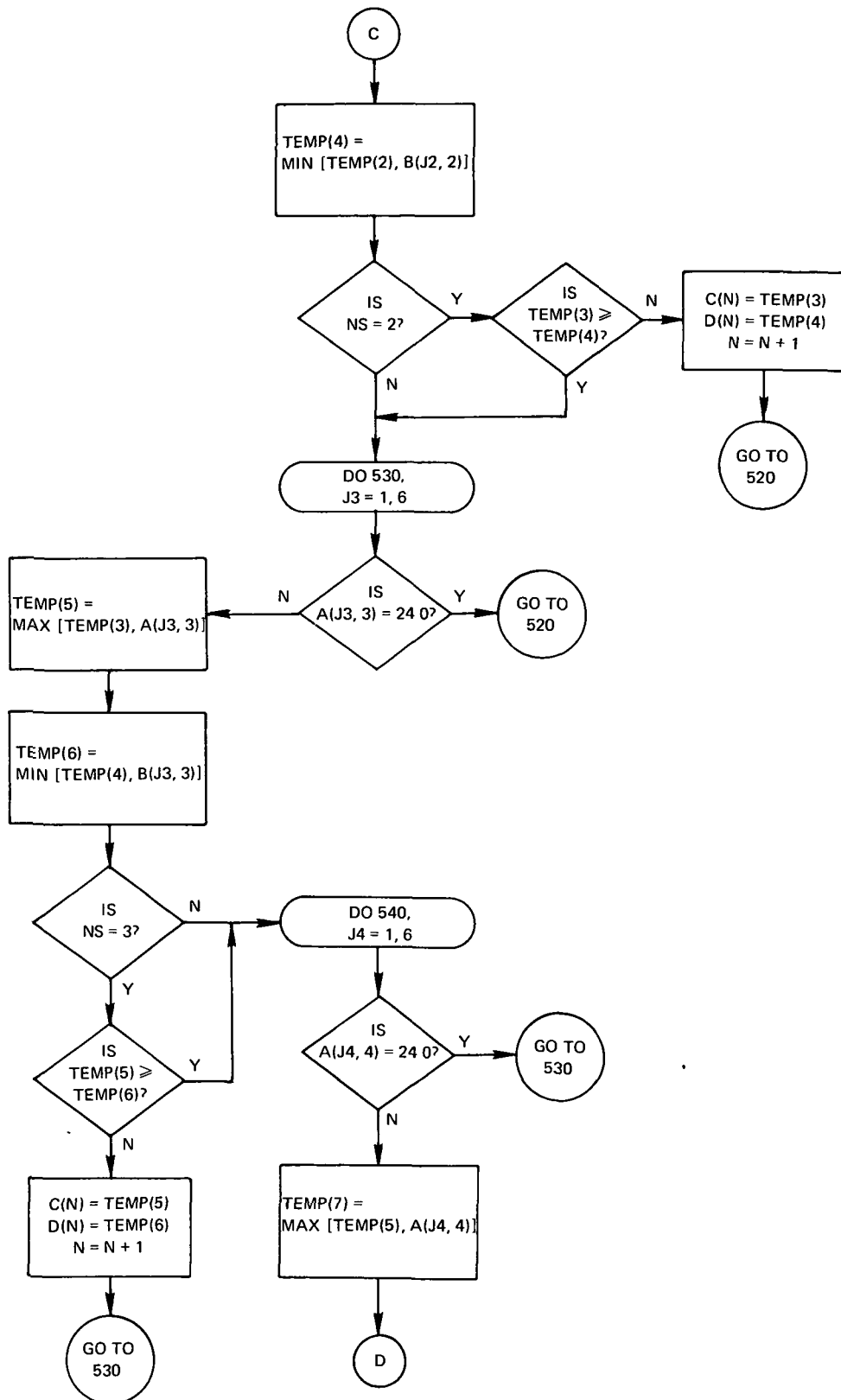
*****SUBPROGRAMS REQUIRED-

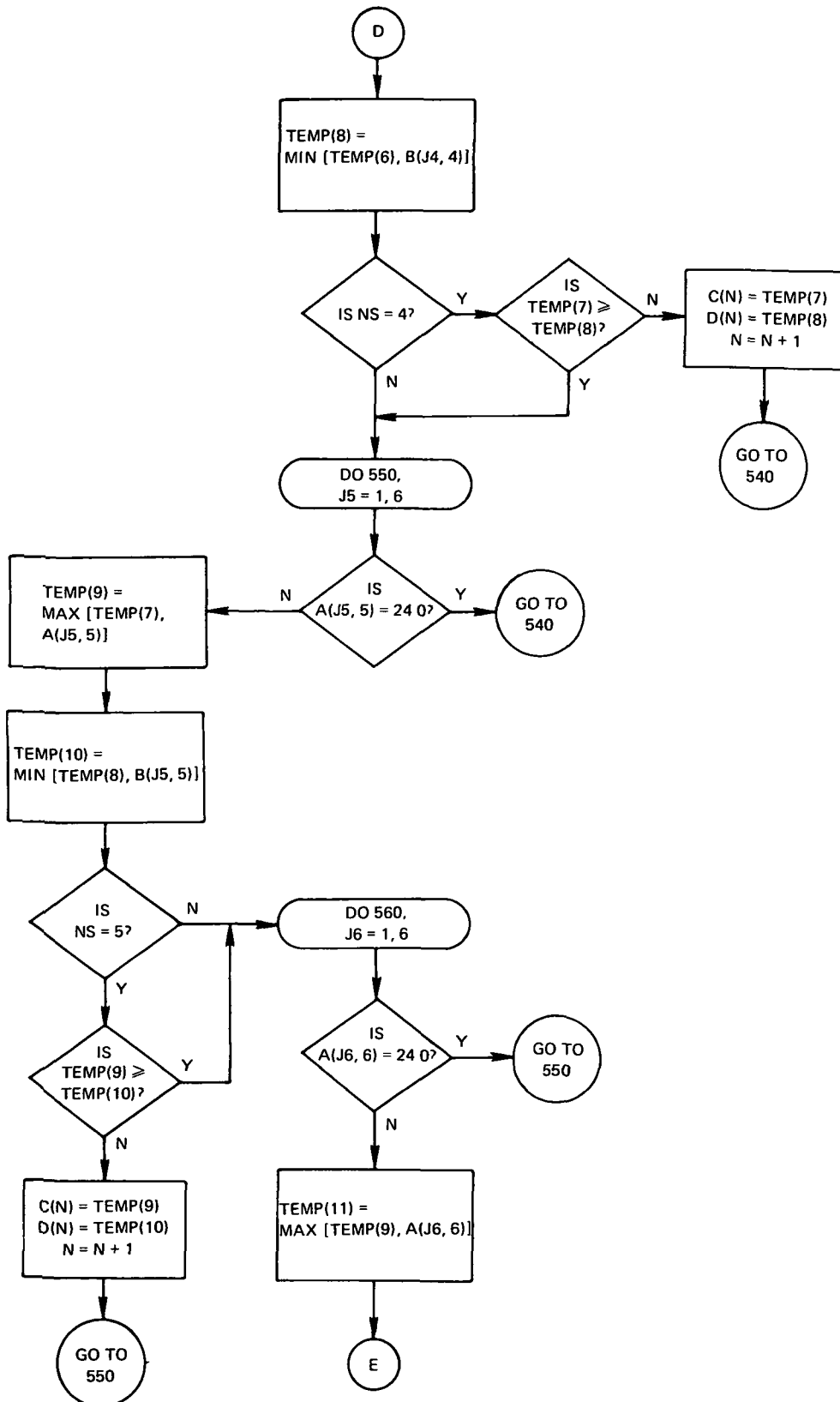
ICAS

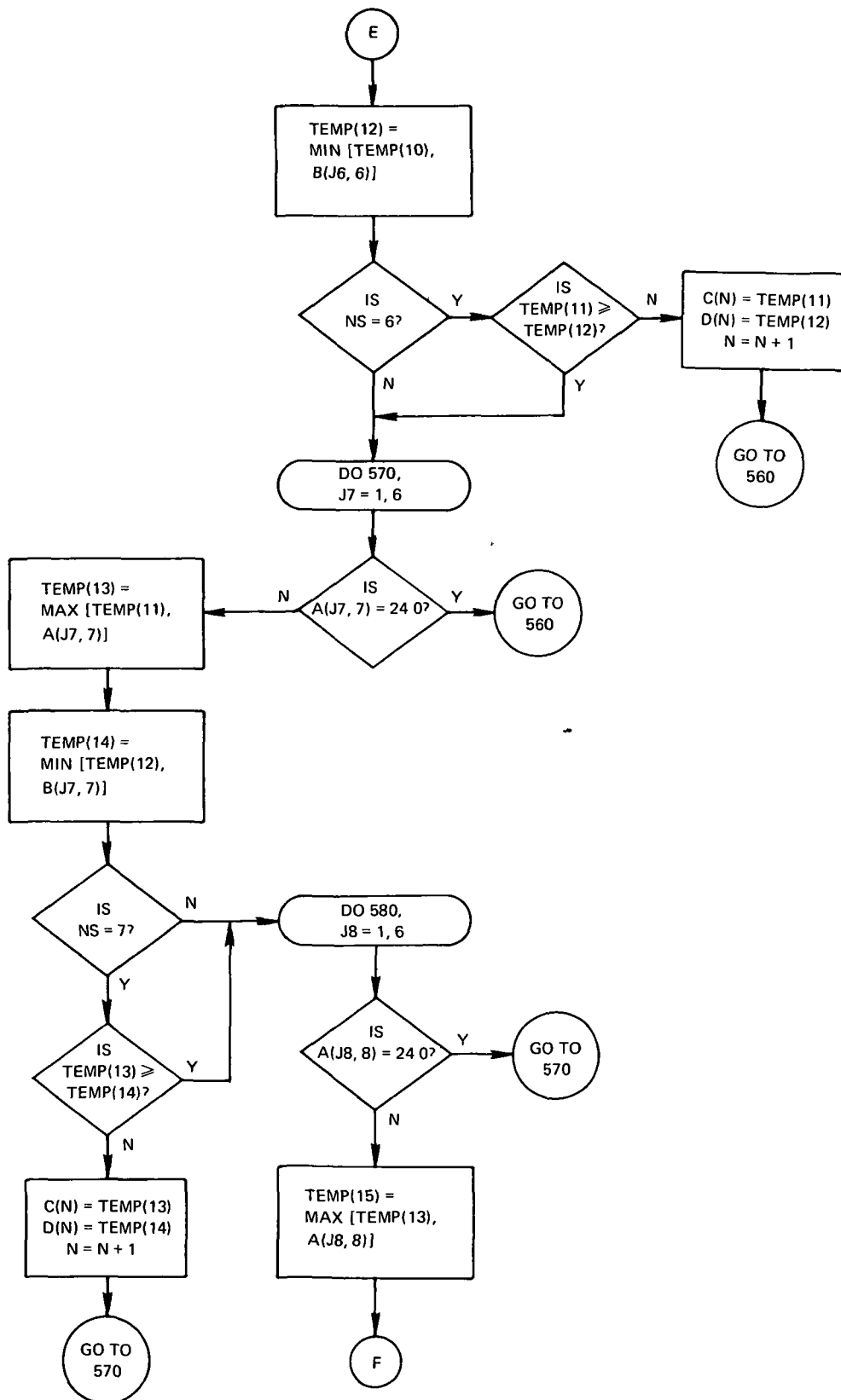


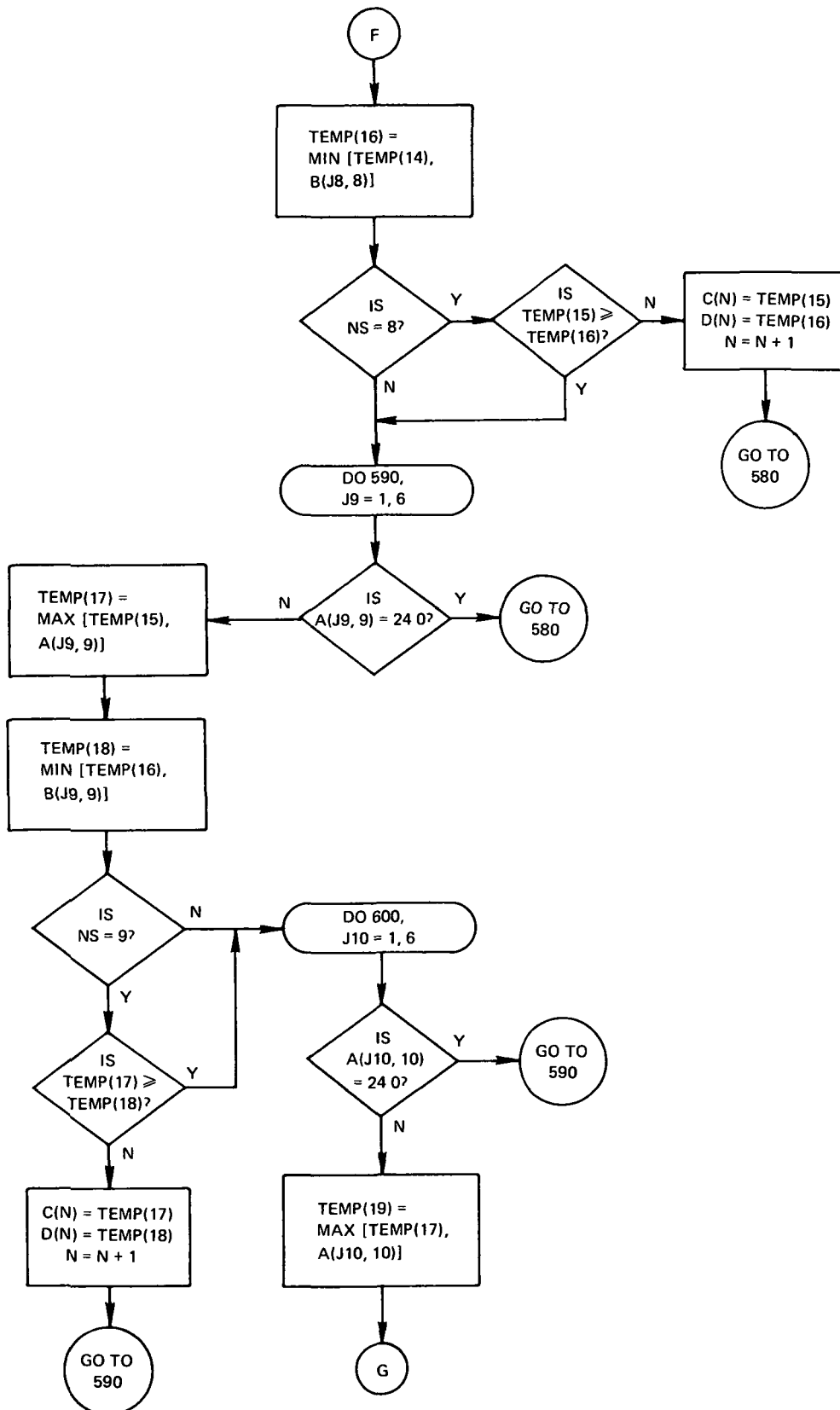


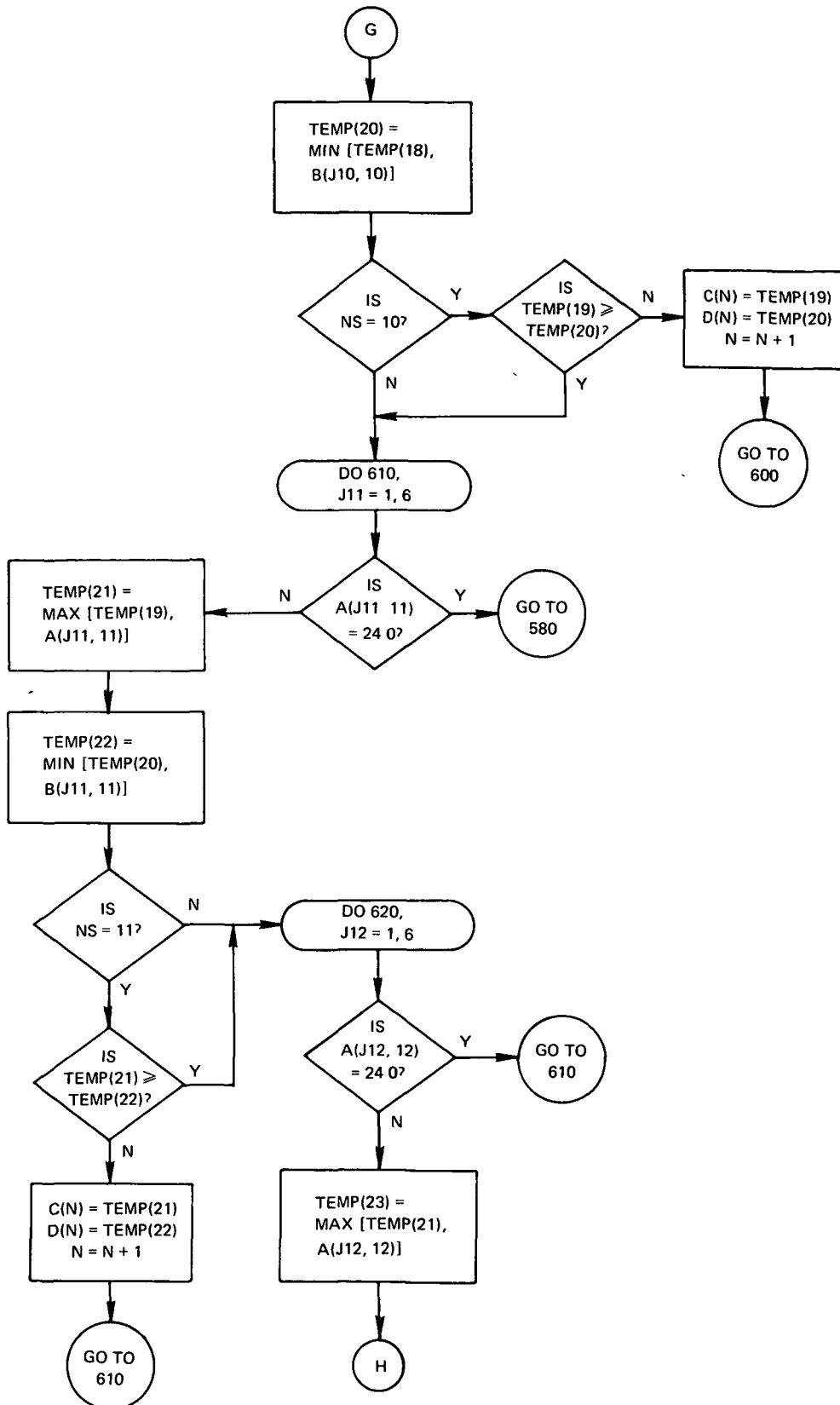


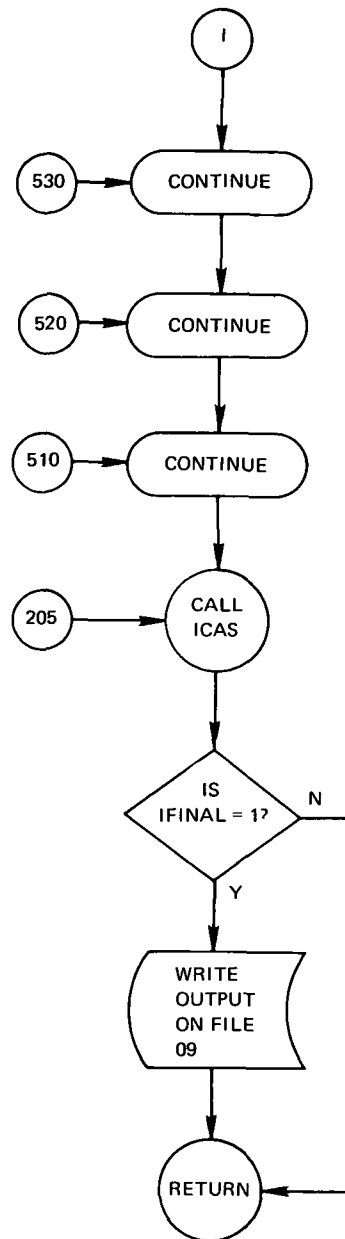
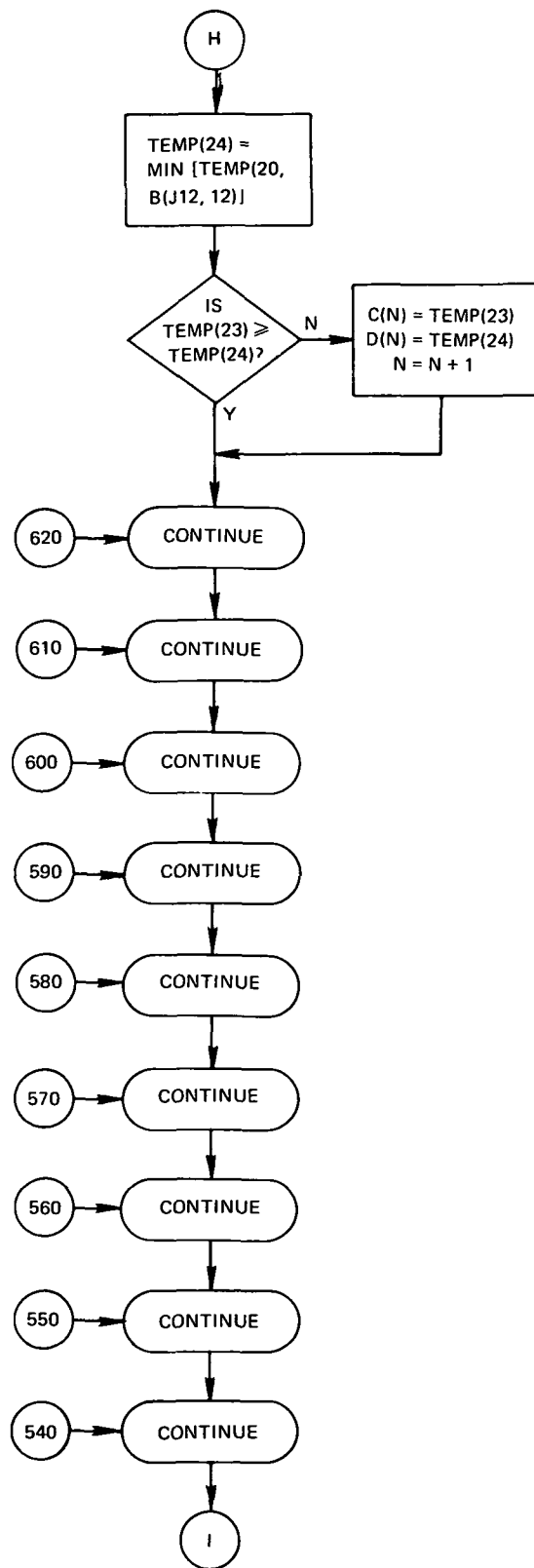












*****TEMPORARY FILE 9 DATA*****

*****NASA Wallops version of 05/01/71

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

*****PURPOSE-

TO CALCULATE A COMBINED RELEASE WINDOW FOR VARIOUS RELEASE POINTS AND/OR DEFINED PROBLEM CONSTRAINTS (EXCLUDING THE SUN AND MOON CONSTRAINTS);

*****METHOD-

THE MOST RECENT COMBINED RELEASE WINDOW CALCULATED BY SUBROUTINE TTLWBO IS COMBINED WITH THOSE OF PRIOR RUN CASES WITHIN THIS JOB, FOR THE FIRST CASE THE WINDOW IS ONLY RECORDED ON THE TEMPORARY FILE 13, JULIAN DATES ARE CHECKED TO INSURE COMPATIBILITY.

*****INPUT-

| | |
|-------|---|
| UJUL | =JULIAN DATE FOR CURRENT DATA, |
| C(6) | =ARRAY OF MOST RECENT CASE OF COMBINED WINDOW =START TIMES FOR CURRENT DATE, |
| D(6) | =ARRAY OF MOST RECENT CASE OF COMBINED WINDOW =STOP TIMES FOR CURRENT DATE, |
| ICASE | =CASE NUMBER |
| IDAY | =CURRENT NUMBER OF DAYS FROM FIRST DAY CALCULATED |

*****OUTPUT-

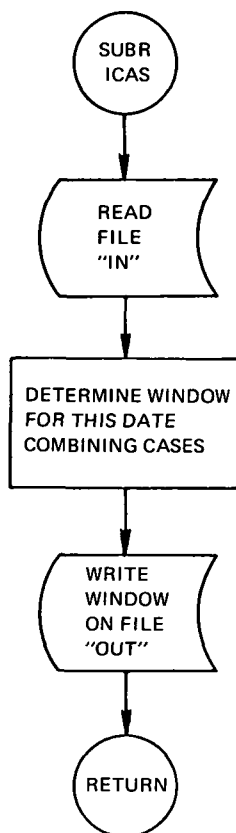
| | |
|------|--|
| A(6) | =ARRAY OF TOTAL CASES SO FAR CALCULATED OF =COMBINED WINDOW START TIMES FOR CURRENT DATE, |
| B(6) | =ARRAY OF TOTAL CASES SO FAR CALCULATED OF =COMBINED WINDOW STOP TIMES FOR CURRENT DATE, |

*****RESTRICTIONS-

ONLY THOSE CONSTRAINTS CURRENTLY DEFINED IN THE BICWINDOW COMPUTER PROGRAM CAN BE COMBINED,

*****SUBPROGRAMS REQUIRED-

NONE



*****SUBROUTINE OUT2*****

*****NASA WALLOPS VERSION OF 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

*****PURPOSE-

TO UTILIZE THE PROPER SUBROUTINES FOR OUTPUT PRINTING AND/OR PLOTTING FOR THE TIME PERIOD AS REQUESTED ON INPUT CARD 'B'.

*****METHOD-

THIS SUBROUTINE CALCULATES THE JULIAN DATE FOR THOSE DATES REQUESTED FOR PRINTING AND/OR PLOTTING. IT THEN CALLS THE PROPER SUBROUTINES TO EXECUTE THE PRINTING AND/OR PLOTTING AS REQUESTED. IF NO PRINTING OR PLOTTING IS DESIRED THEN THE SUBROUTINE TERMINATES AFTER FINDING THE JULIAN DATES DEFINED ABOVE.

*****INPUT-

KMO

-MONTH PLOTTING AND/OR PRINTING TO BEGIN

| | |
|-------|--|
| KDA | -DAY PLOTTING AND/OR PRINTING TO BEGIN |
| KYR | -YEAR PLOTTING AND/OR PRINTING TO BEGIN |
| LMQ | -MONTH PLOTTING AND/OR PRINTING TO END |
| LDA | -DAY PLOTTING AND/OR PRINTING TO END |
| LYR | -YEAR PLOTTING AND/OR PRINTING TO END |
| IPRT7 | -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07 -DATA -00; PRINT FILE 07 DATA -01; DO NOT PRINT FILE 07 DATA |
| IPRT9 | -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09 -DATA -00; PRINT FILE 09 DATA -01; DO NOT PRINT FILE 09 DATA |
| IPLOT | -INTEGER CODE TO SIGNAL REQUEST PLOTTING DATA -00; CREATE A TAPE FOR PLOTTING DATA FOR A - CALENDAR YEAR THROUGH FILE 01 AT 556 BPI -01; CREATE A TAPE FOR PLOTTING DATA FOR A - CALENDAR MONTH THROUGH FILE 01 AT 556 BPI -02; DO NOT CREATE A PLOT TAPE |
| ICASE | -CASE NUMBER |

*****OUTPUT=

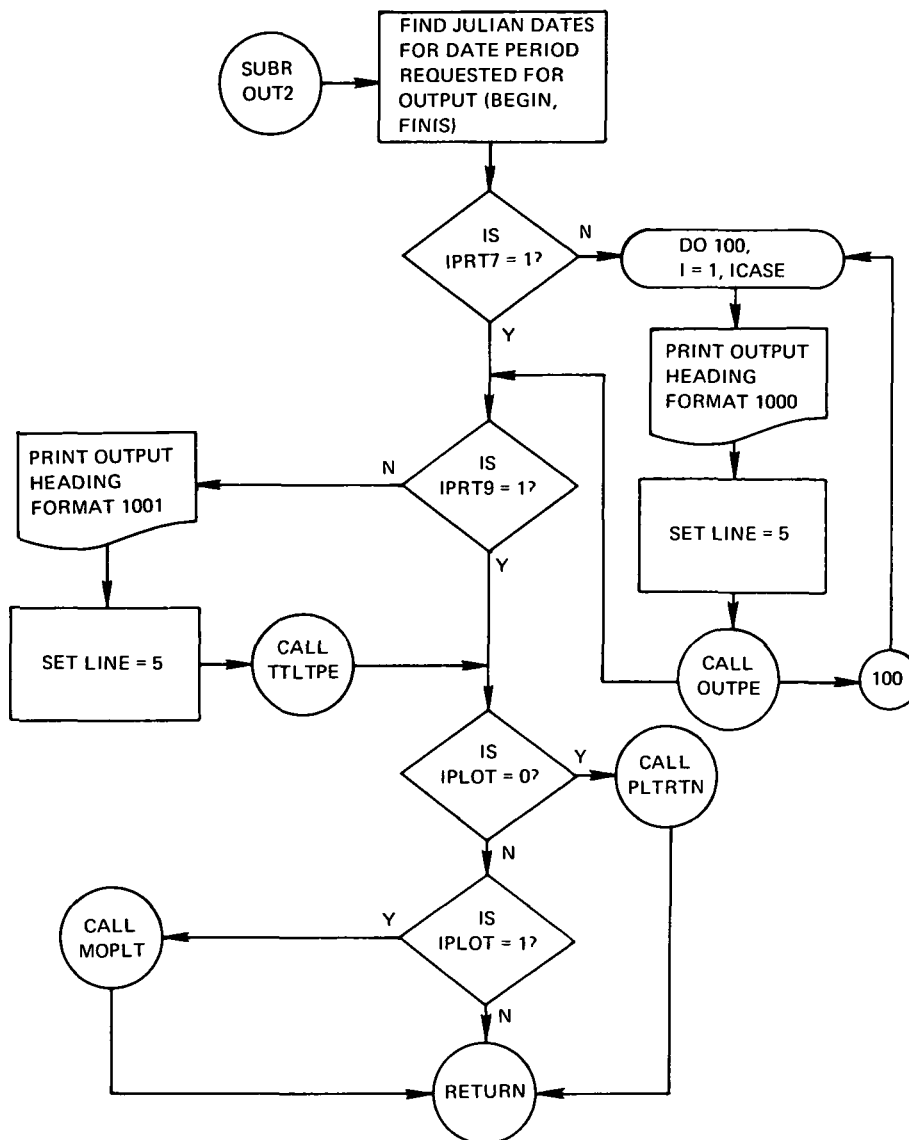
| | |
|-------|--|
| BEGIN | -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING |
| FINIS | -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING |
| LINE | -LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT -HEADING |

*****RESTRICTIONS=

THIS SUBROUTINE REQUIRES THE EXISTENCE OF FILES 07 AND 09 AND IF EITHER IS TO BE USED THEN THE DATA MUST EXIST FOR THOSE DATES REQUESTED,

*****SUBPROGRAMS REQUIRED=

DAYNUM
OUTTPE
TTLTPE
PLTRTN



*****PRINT ROUTINE FOR FILE 07 DATA*****

*****NASA Wallops version of 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE-GE 625

*****PURPOSE-

TO PRINT THE DAILY RELEASE WINDOW DATA FOR EACH CONSTRAINT AND
FOR EACH STATION,

*****METHOD-

THE DAILY RELEASE WINDOW TIMES CALCULATED FOR EACH STATION AND
EACH CONSTRAINT STORED ON FILE 07 IS FIRST READ BY THIS
SUBROUTINE, THE DATA IS THEN PRINTED IN HOURS AND MINUTES FOR
THOSE DAYS WITHIN JULIAN DATES (BEGIN) AND (FINIS), THE DATE,
CONSTRAINT NAME AND STATION NAME ARE PRINTED ALONG WITH THE

TIME INTERVALS IN VARIED FORMATS, THIS PROGRAM WILL TERMINATE IF THE JULIAN DATE OF THE CURRENT TAPE RECORD BEING READ IS EITHER GREATER THAN 'FINIS' OR EQUAL TO 999.0.

*****INPUT-

ON FILE 07

| | |
|------------|--|
| LINE | -LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT -HEADING |
| BEGIN | -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING |
| FINIS | -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING |
| DJUL | -JULIAN DATE FOR CURRENT DATA |
| K | -INDEX FOR CONSTRAINTS -#1, EARTH SHADOW -#2, NOT USED -#3, SUN -#4, MOON -#5, TOTAL SKY BACKGROUND BRIGHTNESS |
| IDAY | -DAY NUMBER FOR DATE OF CURRENT DATA |
| IMONTH | -MONTH FOR DATE OF CURRENT DATA |
| IYEAR | -YEAR FOR DATE OF CURRENT DATA |
| NRESTR(3) | -ALPHANUMERIC NAME OF CONSTRAINT |
| NAME(3,12) | -NAME OF TRACKING STATIONS USED |
| WINDOW(6) | -THE DAILY RELEASE WINDOW START/STOP TIMES, -1ST INDEX FOR STORING START/STOP TIMES, -1,3,5 FOR START TIMES -2,4,6 FOR STOP TIMES |

*****OUTPUT-

ON FILE 06-PRINTER

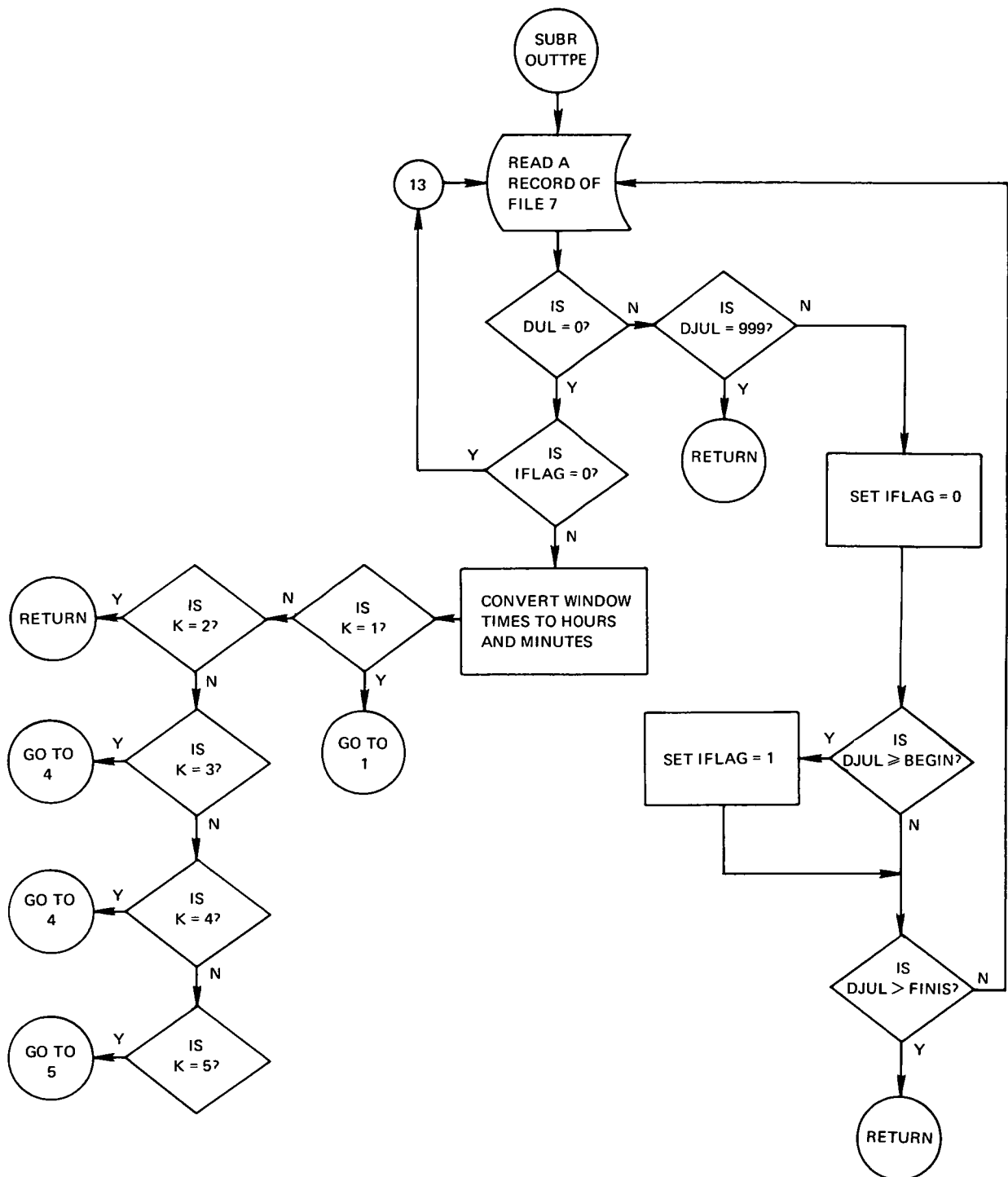
| | |
|-----------|--|
| IDAY | -DAY NUMBER FOR DATE OF CURRENT DATA |
| IMONTH | -MONTH FOR DATE OF CURRENT DATA |
| IYEAR | -YEAR FOR DATE OF CURRENT DATA |
| NRESTR(3) | -ALPHANUMERIC NAME OF CONSTRAINT |
| NAME(3) | -NAME OF TRACKING STATIONS USED |
| IW(6) | -INTEGRAL HOUR VALUE OF START/STOP TIMES |
| IW(6) | -INTEGRAL MINUTE VALUE OF START/STOP TIMES |

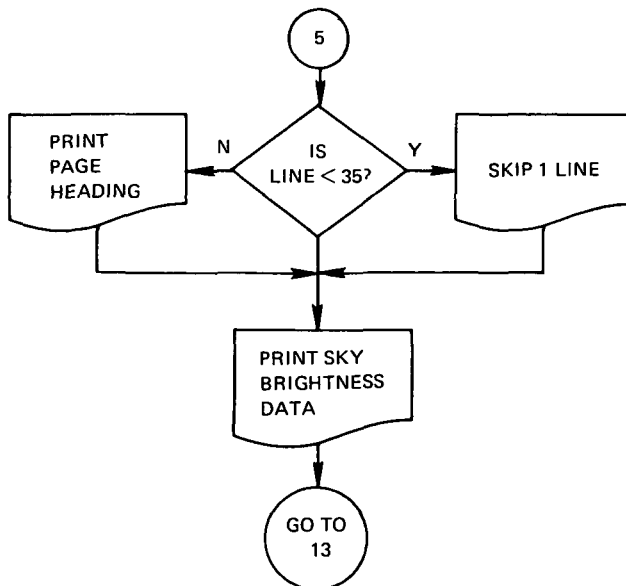
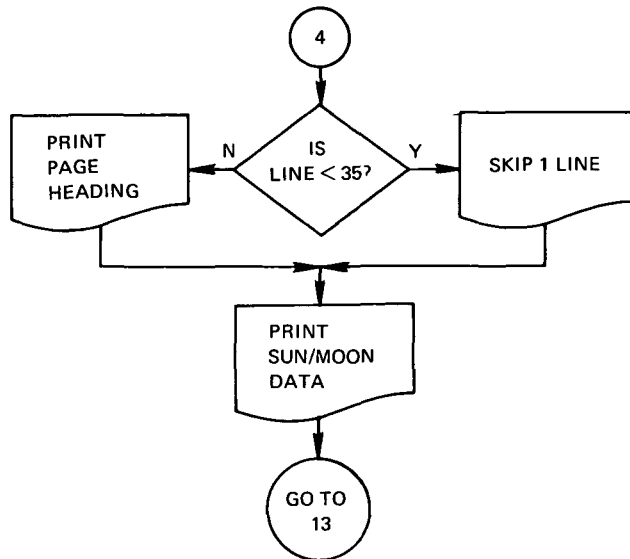
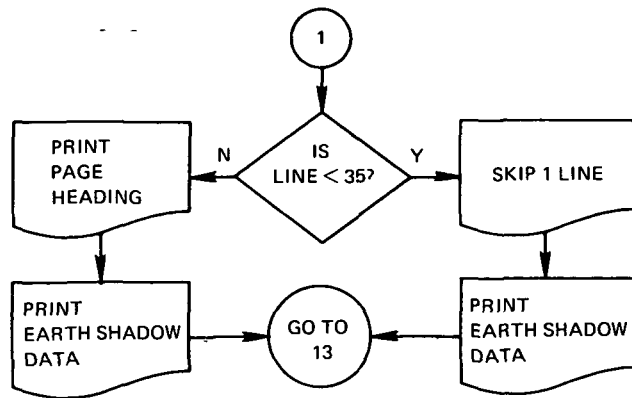
*****RESTRICTIONS-

THE NUMBER OF TIME INTERVALS PER CONSTRAINT IS FIXED BY THE REQUIREMENTS OF THE PROGRAM.
SUBROUTINE OUTPUTS TIME VARIABLES WITH NO GREATER ACCURACY THAN ONE MINUTE.

*****SUBPROGRAMS REQUIRED-

NONE





*****WRITE FILE 09*****

*****NASA Wallops version of 02/01/70

*****LANGUAGE=FORTRAN IV

*****MACHINE-GE 625

*****PURPOSE-

TO PRINT THE TOTAL COMBINED WINDOW DATA FOR THE DATES REQUESTED

*****METHOD-

THE COMBINED WINDOW DATA STORED ON FILE 09 IS READ BY THIS SUBROUTINE. IT IS CONVERTED TO HOURS AND MINUTES BEFORE PRINTING A CHECK IS MADE TO SEE IF THE JULIAN DATE OF THE CURRENT RECORD IS WITHIN THE DATES REQUESTED FOR PRINTING, ONLY THE BLOCK OF DATA WITHIN THE DATES REQUESTED IS PRINTED AND ONLY THOSE TRUE DATA INTERVALS ARE PRINTED, AN END OF FILE CODE WHERE THE JULIAN DATE EQUALS 999.0 IS USED TO TERMINATE THIS SUBROUTINE.

*****INPUT-

ON FILE 09

| | |
|--------|--|
| EPOCH | -JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS ON -FILE 09 |
| DJUL | -JULIAN DATE FOR CURRENT DATA |
| IDAY | -DAY NUMBER FOR DATE OF CURRENT DATA |
| IMONTH | -MONTH FOR DATE OF CURRENT DATA |
| IYEAR | -YEAR FOR DATE OF CURRENT DATA |
| BEGIN | -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING |
| FINIS | -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING |
| LINE | -LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT -HEADING |
| C(6) | -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT -DATE |
| D(6) | -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT -DATE |

*****OUTPUT-

FILE 06-PRINTER

| | |
|--------|---------------------------------------|
| DJUL | -JULIAN DATE FOR CURRENT DATA |
| IDAY | -DAY NUMBER FOR DATE OF CURRENT DATA |
| IMONTH | -MONTH FOR DATE OF CURRENT DATA |
| IYEAR | -YEAR FOR DATE OF CURRENT DATA |
| IC(6) | -INTEGRAL VALUE OF START TIME HOURS |
| JC(6) | -INTEGRAL VALUE OF START TIME MINUTES |
| ID(6) | -INTEGRAL VALUE OF STOP TIME HOURS |

JD(6)

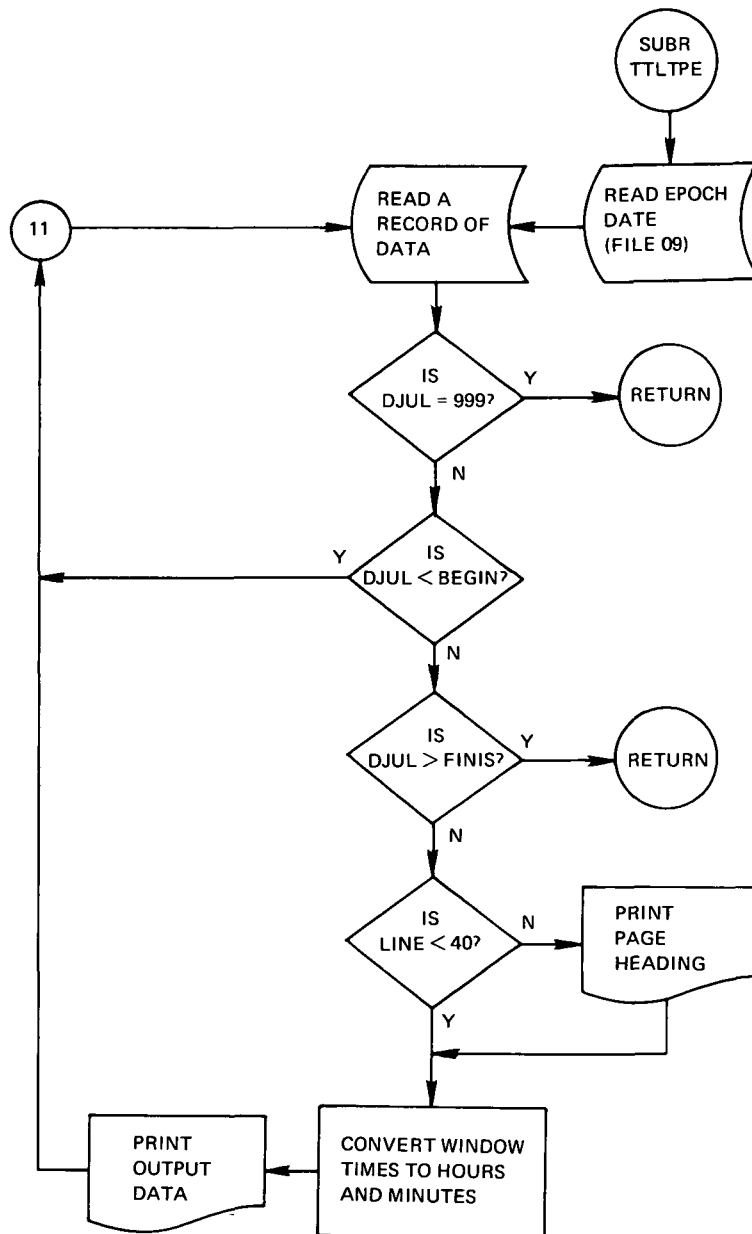
•INTEGRAL VALUE OF STOR TIME MINUTES

*****RESTRICTIONS-

UP TO SIX DIFFERENT COMBINED WINDOW TIME INTERVALS CAN BE READ
AND PRINTED

*****SUBPROGRAMS REQUIRED-

NONE



*****PLOT ROUTINE*****

*****NASA WALLOPS VERSION OF 01/01/69

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

*****PURPOSE-

TO GRAPH THE COMPUTED RELEASE WINDOW TIMES FOR A GIVEN YEAR OR PORTION OF A YEAR.

*****METHOD-

THIS SUBROUTINE USES EXISTING CALCOMB LIBRARY ROUTINES TO PLOT THE RELEASE TIMES CALCULATED FOR THE BIG PROJECT THROUGH THIS PROGRAM ONTO A GRID AS SET UP IN SUBROUTINE CALDNR. THE INPUT POSITION OF THE RELEASE POINT, THE TRACKING STATIONS USED AND THE VALUE OF EACH CONSTRAINT IS GIVEN IN THE PLOT LABELLING. RELEASE TIMES PLOTTED ARE THOSE DAILY TIMES RECORDED ON FILE 09 BY THIS PROGRAM.

*****RESTRICTIONS-

THIS SUBROUTINE WILL PLOT DATA ONLY FOR A GIVEN CALENDAR YEAR OR PORTION OF IT. PLOTTING OF TWO OR MORE CALENDAR YEARS REQUIRES THAT THE PROGRAM BE REINITIATED FOR PLOTTING EACH CALENDAR YEAR. THIS RESTRICTION IS DUE TO THE GRID PLOT GENERATED THROUGH SUBROUTINE CALDNR. A CHECK IS MADE TO INSURE THE NUMBER OF DAYS PAST JANUARY 1 OF THE GIVEN CALENDAR YEAR IS NO MORE THAN 365 DAYS. THIS CHECK IS DONE SO THE PLOTS OF SUCCESSIVE CALENDAR YEARS CAN BE MADE FROM ONE FILE 09 TAPE, NEGLECTING THIS RESTRICTION AND ATTEMPTING TO PLOT SUCCESSIVE CALENDAR YEARS ON THE SAME GRID WILL GIVE AN ERRONEOUS PLOT. (E.G. EVERY JANUARY 1 OF ANY CALENDAR YEAR WILL BE PLOTTED AT THE BEGINNING OF THE GRID)

*****INPUT-

1. FOR PLOT LABELLING ONLY-

| | |
|----------|---|
| KYR | =YEAR BEING PLOTTED AND/OR PRINTED |
| PHIPDG | =GEODETTIC LATITUDE OF RELEASE POINT (DEG) |
| LAMPDG | =LONGITUDE OF RELEASE POINT (DEG) |
| HEIGHT | =ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE =(FEET) |
| RESTR(2) | =MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION TO THE RELEASE POINT (DEG) |
| RESTR(3) | =MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH TRACKING STATION (DEG) |
| RESTR(4) | =MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH TRACKING STATION (DEG) |

RESTR(5) -MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE
 -RELEASE POINT AS SEEN FROM EACH TRACKING STATION
 -(RAYLEIGHS)
 RESTR(6) -CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD
 -AFTER RELEASE; RELATIVE TO THE TRACKING STATIONS
 -(KM/SEC)
 RESTR(7) -MINIMUM TRACKING PERIOD REQUIRED (HRS)
 RESTR(8) -ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE
 -RELATIVE TO THE EARTH (KM/SEC)
 NAME(3,12) -NAME OF TRACKING STATIONS USED
 ICASE -CASE NUMBER

2. USED FOR DATA PLOTTING-

NS -THE NUMBER OF STATIONS USED IN THE PROGRAM
 NOS(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED
 EPOCH -JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS ON
 -FILE 09
 DJUL -JULIAN DATE FOR CURRENT DATA
 BEGIN -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING
 FINIS -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING
 C(6) -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT
 -DATE
 D(6) -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT
 -DATE

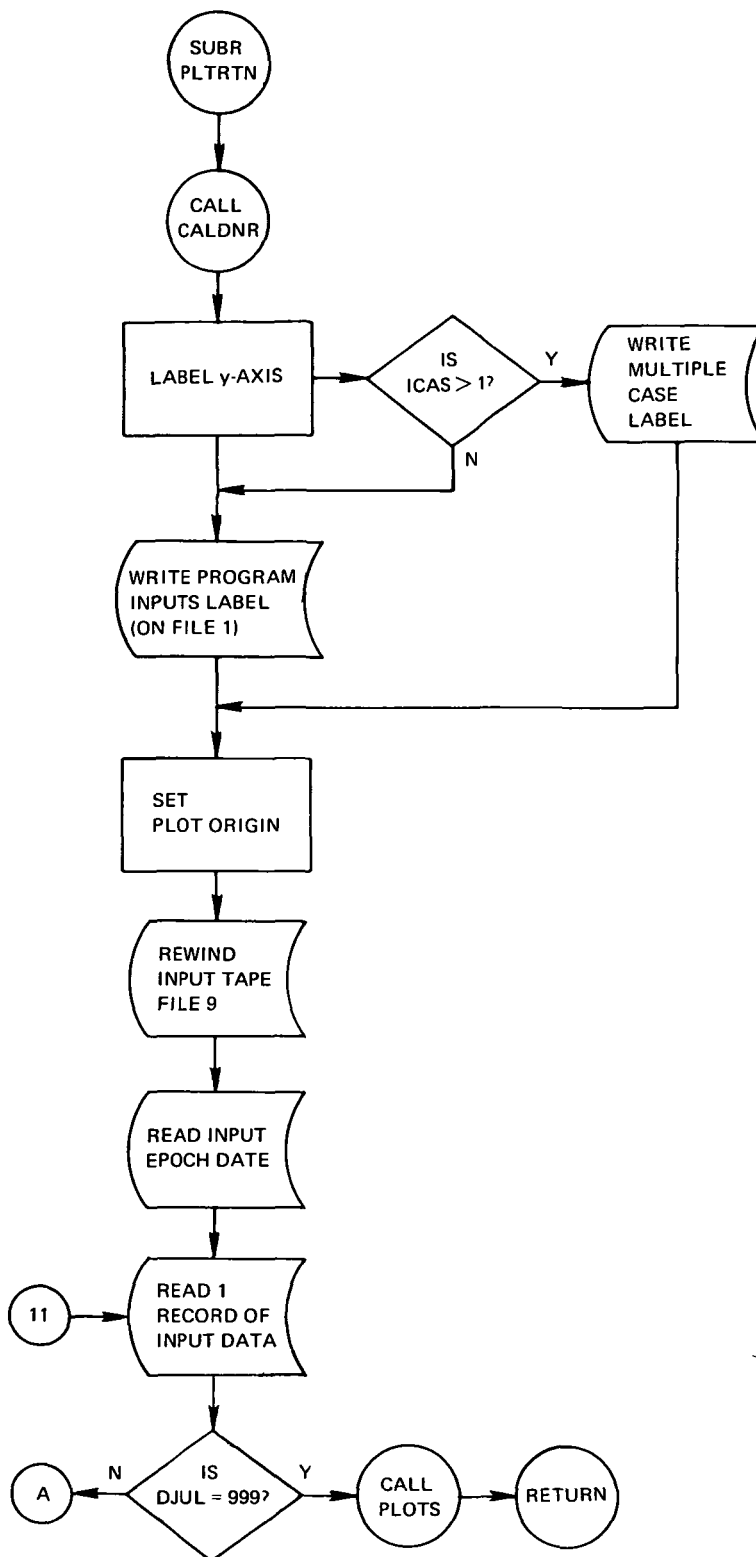
*****OUTPUT-

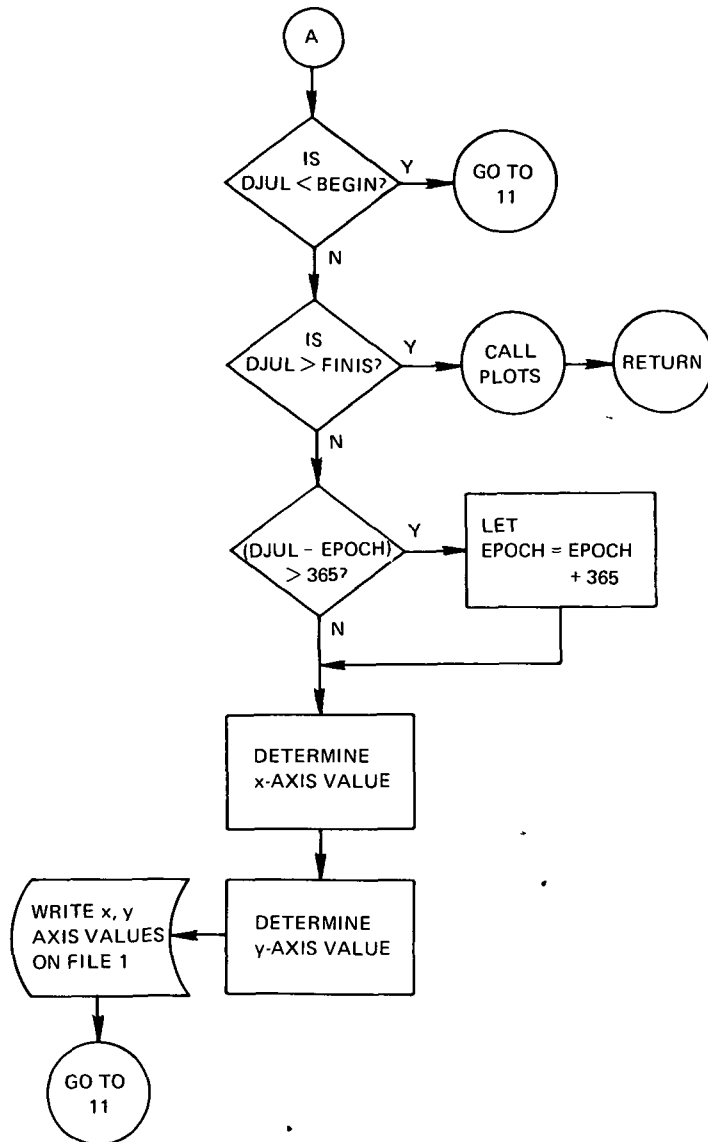
DATA POINTS FOR PLOT ARE STORED ON TAPE FILE 01 AT 556 BPI

X -POSITION OF PLOT PEN ON X-AXIS REPRESENTING THE
 -DATE BEING PLOTTED
 Y -POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE
 -START TIME FOR DATE BEING PLOTTED
 H -POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE
 -STOP TIME FOR DATE BEING PLOTTED

*****SUBPROGRAMS REQUIRED-

BAR (CALCOMP LIBRARY ROUTINE)
 PLOT (CALCOMP LIBRARY ROUTINE)
 NUMBER (CALCOMP LIBRARY ROUTINE)
 SYMBOL (CALCOMP LIBRARY ROUTINE)
 DATE- GMAP ASSEMBLY
 CALDNR





*****SUBROUTINE CALND *****

*****NASA Wallops Version of 01/01/69

*****LANGUAGE=FORTRAN IV

*****MACHINE=GE 625

*****PURPOSE=

TO PLOT A GRID ON TWELVE INCH PLAIN PAPER REPRESENTING AN
ENTIRE 365 DAY YEAR, EACH LINE DRAWN FROM THE ABSCISSA REPRESENTS
A DAY OF THE YEAR, THE MONTHS OF THE YEAR ARE ALSO PLOTTED,

*****METHOD=

USING TWELVE INCH PAPER, GRIDS FOR THE DAYS ARE DRAWN TO A SCALE
FACTOR OF 20 LINES PER INCH USING THE LIBRARY PLOT ROUTINES,

*****INPUT=

NONE

*****OUTPUT-

GRID LINES ON OUTPUT TAPE FILE 01.

*****RESTRICTIONS-

THE GRID IS FORMED TO CONSTRUCT A GRID SYSTEM OF 365 DAYS IN A YEAR ONLY.
THE GRID BEGINS ON JANUARY 1 AND ENDS ON DECEMBER 31 ALWAYS,

*****SUBPROGRAMS REQUIRED-

PLOTS
FACTOR
GRID
NUMBER
PLOT
SYMBOL

*****MONTHLY PLOT ROUTINE*****

*****NASA Wallops version of 01/01/69

*****LANGUAGE=FORTRAN IV

*****MACHINE-GE 625

*****PURPOSE-

TO GRAPH THE COMPUTED RELEASE WINDOW TIMES FOR A GIVEN MONTH OR PORTION OF IT,

*****METHOD-

THIS SUBROUTINE USES EXISTING CALCOMP LIBRARY ROUTINES TO PLOT THE RELEASE TIMES CALCULATED THROUGH THIS PROGRAM ONTO A GRID AS SET UP IN SUBROUTINE MOCALD. THE INPUT POSITION OF THE TARGET RELEASE POINT, THE TRACKING STATIONS USED AND THE VALUE OF EACH CONSTRAINT IS GIVEN IN THE PLOT LABELLING. RELEASE TIMES PLOTTED ARE THOSE DAILY TIMES RECORDED ON FILE 09 BY THIS PROGRAM,

*****INPUT-

1.FOR PLOT LABELLING ONLY-

| | |
|----------|--|
| KMO | -MONTH BEING PLOTTED AND/OR PRINTED |
| KYR | -YEAR BEING PLOTTED AND/OR PRINTED |
| PHIPDG | -GEODETIC LATITUDE OF RELEASE POINT(DEG) |
| LAMPDG | -LONGITUDE OF RELEASE POINT (DEG) |
| HEIGHT | -ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE -(EQU) |
| RESTR(2) | -MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION -TO THE RELEASE POINT (DEG) |
| RESTR(3) | -MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH -TRACKING STATION (DEG) |
| RESTR(4) | -MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH -TRACKING STATION (DEG) |
| RESTR(5) | -MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE -RELEASE POINT AS SEEN FROM EACH TRACKING STATION -(RAYLEIGHS) |

RESTR(6) -CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD
 -AFTER RELEASE RELATIVE TO THE TRACKING STATIONS
 -(KM/SEC)
 RESTR(7) -MINIMUM TRACKING PERIOD REQUIRED (HRS)
 RESTR(8) -ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE
 -RELATIVE TO THE EARTH (KM/SEC)
 NAME(3,12) -NAME OF TRACKING STATIONS USED
 ICASE -CASE NUMBER

2. USED FOR DATA PLOTTING-

NS -THE NUMBER OF STATIONS USED IN THE PROGRAM
 NOS(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED
 EPOCH -JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS ON
 -FILE 09
 DJUL -JULIAN DATE FOR CURRENT DATA
 BEGIN -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING
 FINIS -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING
 C(6) -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT
 -DATE
 D(6) -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT
 -DATE

*****OUTPUT-

DATA POINTS FOR PLOT ARE STORED ON TAPE FILE 01 AT 556 BPI

X -POSITION OF PLOT PEN ON X-AXIS REPRESENTING THE
 -DATE BEING PLOTTED
 Y -POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE
 -START TIME FOR DATE BEING PLOTTED
 H -POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE
 -STOP TIME FOR DATE BEING PLOTTED

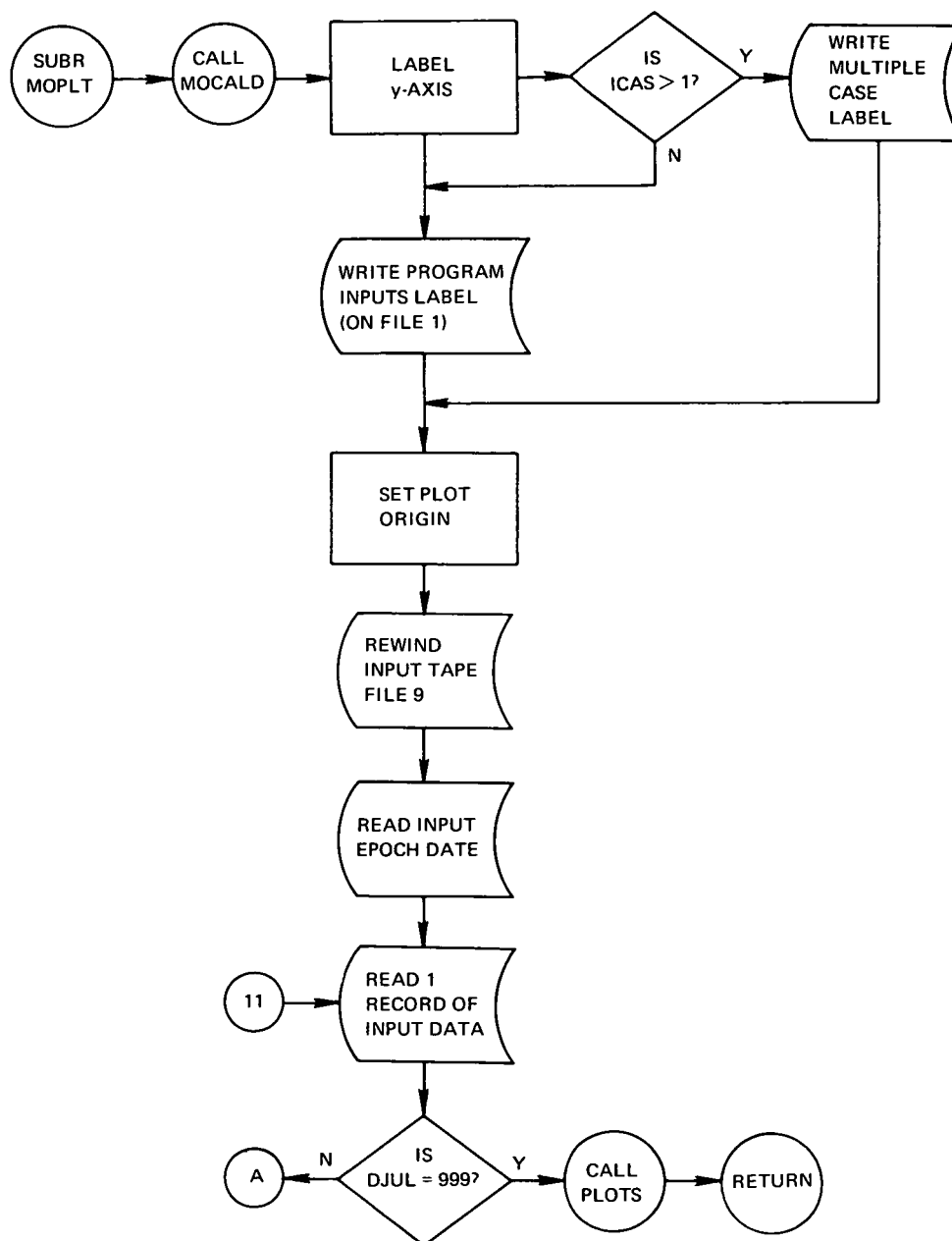
*****RESTRICTIONS-

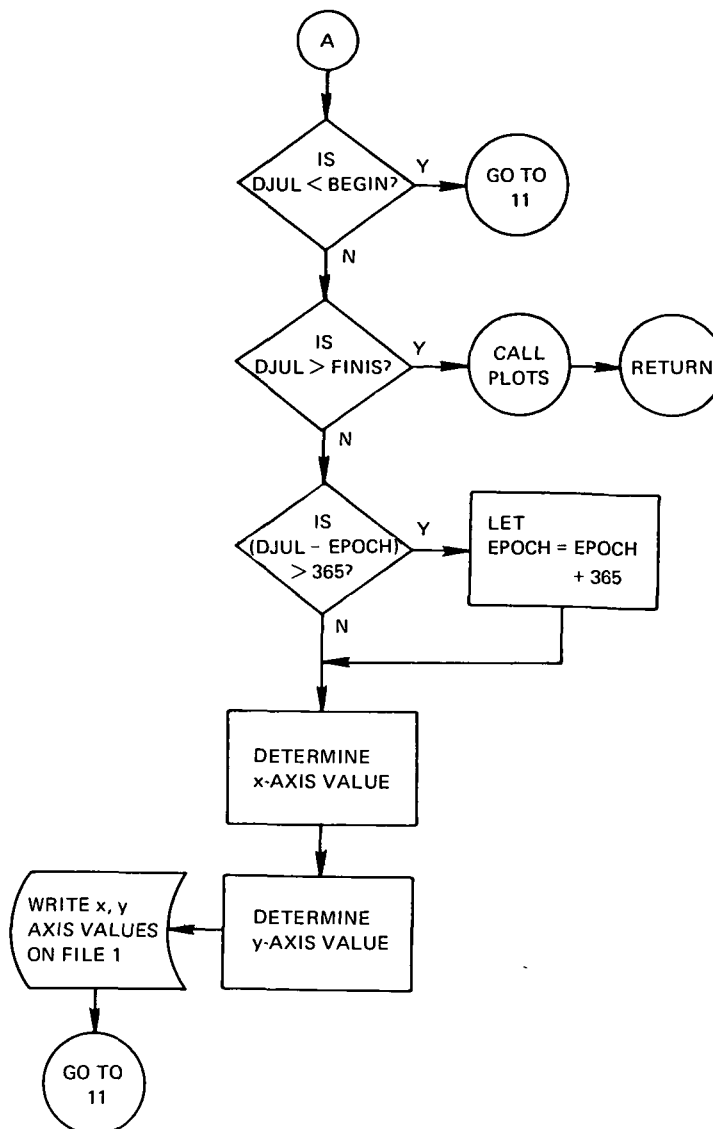
THIS SUBROUTINE WILL PLOT DATA ONLY FOR A GIVEN CALENDAR MONTH
 OR PORTION OF IT, PLOTTING OF TWO OR MORE CALENDAR MONTHS
 REQUIRES THAT THE PROGRAM BE REINITIATED FOR PLOTTING EACH
 CALENDAR MONTH, THIS RESTRICTION IS DUE TO THE GRID PLOT
 GENERATED THROUGH SUBROUTINE MOCALD, A CHECK IS MADE TO INSURE
 THE NUMBER OF DAYS PAST THE FIRST OF THE GIVEN CALENDAR MONTH
 IS WITHIN BOUNDS, THIS CHECK IS DONE SO THE PLOTS OF
 SUCCESSIVE CALENDAR MONTHS CAN BE MADE FROM ONE FILE 09 TAPE,
 NEGLECTING THIS RESTRICTION AND ATTEMPTING TO PLOT SUCCESSIVE
 CALENDAR MONTHS ON THE SAME GRID WILL GIVE AN ERRONEOUS PLOT,
 THIS PROGRAM HANDLES UP TO 12 STATIONS TO GET COMBINED WINDOWS

*****SUBPROGRAMS REQUIRED-

BAR (CALCOMP LIBRARY ROUTINE)

PLOT (CALCOMP LIBRARY ROUTINE)
 NUMBER (CALCOMP LIBRARY ROUTINE)
 SYMBOL (CALCOMP LIBRARY ROUTINE)
 DATE- GMAP ASSEMBLY
 MOCALD





*****SUBROUTINE MOCALD *****

*****NASA Wallops version of 01/01/69

*****LANGUAGE-FORTRAN IV

*****MACHINE-GE 625

*****PURPOSE-

TO PLOT A GRID ON TWELVE INCH PLAIN PAPER REPRESENTING EACH DAY OF THE MONTH, EACH LINE DRAWN FROM THE ABSCISSA REPRESENTS A DAY OF 1KMOI,

*****METHOD-

USING TWELVE INCH PAPER,GRIDS FOR THE DAYS ARE DRAWN TO A SCALE FACTOR OF 20 LINES PER 3 INCHES USING THE LIBRARY PLOT ROUTINES

*****INPUT-
NONE

*****OUTPUT-
GRID LINES ON OUTPUT TAPE FILE 01.

*****RESTRICTIONS--
THE GRID IS FORMED TO CONSTRUCT A GRID SYSTEM OF THE DAYS OF
'KMO' ONLY.

*****SUBPROGRAMS REQUIRED-
PLOTS
FACTOR
GRID
NUMBER
PLOT
SYMBOL

*****SUBROUTINE NXCARD *****

PROGRAM IDENTIFICATION

PROGRAM TITLE - NXCARD
PROGRAM NO. - 1.1.1304
PROGRAMMED BY - THOMAS HARMON

COMPUTER REQUIRED - GE 625/635
MEMORY REQUIRED - 76 WORDS
PERIPHERALS - CARD READER
PROGRAM LANGUAGE - GMAP

PURPOSE

NXCARD ALLOWS THE USER TO EXAMINE THE NEXT LOGICAL RECORD
RESIDING ON FILE 05. THIS NEXT RECORD WILL NOT ACTUALLY
BE USED AS AN INPUT RECORD UNTIL IT IS REFERENCED BY A
NORMAL FORTRAN READ STATEMENT.

METHOD

THE NEXT LOGICAL RECORD IS EXAMINED USING THE SYSTEM
SUBROUTINE ,FRDB. AFTER THE NEXT LOGICAL RECORD HAS BEEN
OUTPUT TO THE CALLING PROGRAM, THE CURRENT RECORD INDEX IS
RESET TO ITS PREVIOUS VALUE AND A NORMAL RETURN IS EXECUTED.

RESTRICTIONS

1. THE FORMAT USED TO CONVERT THE NEXT CARD MUST HAVE ONLY A
TYPE FIELDS AND MUST READ ONLY ONE LOGICAL RECORD.
2. USE ONLY SINGLE OR NON-SUBSCRIPTED OUTPUT ARRAY NAMES AS
ARGUMENTS TO THIS SUBROUTINE.
3. ENTER THE INTEGER 1 IN THE FIELD WHICH SPECIFIES THE
ARRAY SIZE WHENEVER THE OUTPUT ARRAY NAME IS AN UNDIMEN-
SIONED VARIABLE.
4. THE INPUT FILE MUST HAVE BEEN PREVIOUSLY OPENED BY A
NORMAL FORTRAN READ BEFORE THIS SUBROUTINE IS CALLED FOR
THE FIRST TIME.

INPUT/OUTPUT

CALLING SEQUENCE ..., CALL NXCARD(FORMAT,A,I,B,J,...) WHERE

ETC.

.FRDD.
.FSLI.
.FRYN.

NO USER SUBROUTINES ARE REQUIRED

*****SUBROUTINE DATE*****

```
PROGRAM TITLE      - DATE
PROGRAMMED BY     - DENNIS MELVIN
COMPUTER REQUIRED  - GE 625
PROGRAM LANGUAGE  - GMAP
```

DATE RECORDS THE CURRENT DATE AS STORED WITHIN THE
COMPUTER SYSTEM.

THIS ROUTINE FETCHES THE DATE BY USING THE MASTER MODE ENTRY INSTRUCTION--GETIME--.THE DATE IS THEN PROPERLY FORMATTED FOR THE PLOT ROUTINES FOR PROGRAM 1,1,1615, BIGWINDOW.

CALLING SEQUENCE,..CALL DATE(TODAY) WHERE
TODAY = THE PROPERLY FORMATTED CURRENT DATE, TODAY IS OF
DIMENSION 2,

```

*****
*****
          *      ****      **      *****
          *      *      *      *      *
    ****   ****   *      *      *      *      *      *      *
          *      *      *      *      *      *      *      *
          *      *      *      *      *      *      *      *
          *      *      *      *      *      *      *      *
          *      *      *      *      *      *      *      *
*****
*****
-6.800-      DATE 09-29-72      TIME 15.838      PR 0 17      DUOPS1

```

Appendix C
Computer Printout

This appendix contains the entire source deck listing of the computer program. The program has been written in FORTRAN IV for the GE-625 computer with the exception of subroutines NXCARD and DATE, which have been written in the GE600 assembly language. Either of these two routines can be omitted after minor modifications to subroutines INPUT, PLTRTN, and MOPLT.

Microfiche supplement for NASA SP-3075, A Computer Program to Determine the Possible Daily Release Window for Sky Target Experiments, by Norman H. Michaud, Wallops Station, Wallops Island, Va.

REPRODUCIBILITY OF THE ORIGINAL COPY IS POOR.

*****1.071019 BTW:BDOW MAIN PROGRAM*****

| | | | |
|----|-------|---|----------|
| 1 | CSTRT | BARIUM WINDOW MAIN PROGRAM | STR70001 |
| 2 | C | *****27171615 BIEWINDOW MAIN PROGRAM***** | STR70002 |
| 3 | C | | STR70003 |
| 4 | C | *****START OF DOCUMENTATION CARDS***** | STR70004 |
| 5 | C | | STR70005 |
| 6 | C | *****BARIUM RELEASE WINDOW - PROGRAM NUMBER 17271615 | STR70006 |
| 7 | C | | STR70007 |
| 8 | C | *****NASA WALLOPS VERSION OF 02X01470 | STR70008 |
| 9 | C | | STR70009 |
| 10 | C | *****LANGUAGE-FORTRAN IV | STR70010 |
| 11 | C | | STR70011 |
| 12 | C | *****MACHINE-GE 625 | STR70012 |
| 13 | C | | STR70013 |
| 14 | C | *****PROGRAM AUTHORS- | STR70014 |
| 15 | C | BUTTIS, C. MARSHALL | STR70015 |
| 16 | C | EVERYEN, EDGAR | STR70016 |
| 17 | C | HARRON, THOMAS | STR70017 |
| 18 | C | HAWCOCK, DAVID | STR70018 |
| 19 | C | HELVIN, DENNIS | STR70019 |
| 20 | C | MICHAUD, NORMAN | STR70020 |
| 21 | C | | STR70021 |
| 22 | C | *****PURPOSE- | STR70022 |
| 23 | C | THIS IS THE MAIN PROGRAM WHICH COMPUTES THE RELEASE WINDOWS FOR | STR70023 |
| 24 | C | THE NASA/NPI BARIUM ION CLOUD PROJECT. | STR70024 |
| 25 | C | | STR70025 |
| 26 | C | *****METHOD- | STR70026 |
| 27 | C | THIS PROGRAM PROVIDES AUTOMATIC COMPUTATION OF THE RELEASE | STR70027 |
| 28 | C | WINDOWS SATISFYING THE REQUIREMENTS FOR THE RELEASE CRITERIA, | STR70028 |
| 29 | C | THIS PROGRAM IS DEVELOPED IN MODULAR FORM WITH THE FOLLOWING | STR70029 |
| 30 | C | MAIN FUNCTIONS:,, | STR70030 |
| 31 | C | | STR70031 |
| 32 | C | A;DEFINE PROGRAM INPUTS. | STR70032 |
| 33 | C | | STR70033 |
| 34 | C | B;DEFINE RE-OCCURRING PROGRAM CONSTANTS; | STR70034 |
| 35 | C | | STR70035 |
| 36 | C | C;DEFINE TIME INTERVALS FOR WHICH THE GIVEN TRACKING STATIONS | STR70036 |
| 37 | C | CLOUD RELEASE POINT AND CLOUD POSITION DURING THE TRACKING | STR70037 |
| 38 | C | PERIOD ARE SATISFACTORY FOR THE INPUT VALUES OF THE FOLLOWING | STR70038 |
| 39 | C | CONSTRAINTS:,, | STR70039 |
| 40 | C | | STR70040 |
| 41 | C | 1;THE BARIUM CLOUD IS NOT WITHIN THE SHADOW OF THE EARTH AT | STR70041 |
| 42 | C | RELEASE TIME OR DURING THE EXPERIMENTAL PERIOD; | STR70042 |
| 43 | C | | STR70043 |
| 44 | C | 2;THE RELATIVE ELEVATION LOOK ANGLE FROM EACH TRACKING | STR70044 |
| 45 | C | STATION TO THE CLOUD WILL BE GREATER THAN THAT SPECIFIED IN | STR70045 |
| 46 | C | INPUT;AT TIME OF RELEASE AND DURING THE EXPERIMENTAL PERIOD | STR70046 |
| 47 | C | | STR70047 |
| 48 | C | 3;THE RELATIVE ELEVATION ANGLE OF THE SUN FROM EACH | STR70048 |
| 49 | C | TRACKING STATION IS BELOW THAT OF THE GIVEN CONSTRAINT, | STR70049 |
| 50 | C | | STR70050 |
| 51 | C | 4;THE RELATIVE ELEVATION ANGLE OF THE MOON FROM EACH | STR70051 |
| 52 | C | TRACKING STATION IS BELOW THAT OF THE GIVEN CONSTRAINT, | STR70052 |
| 53 | C | | STR70053 |
| 54 | C | 5;THE SKY BACKGROUND BRIGHTNESS OF THE CLOUD DUE TO | STR70054 |
| 55 | C | AIRGLOW,ZODIACAL LIGHT,AND STARLIGHT IS SEEN FROM EACH | STR70055 |
| 56 | C | TRACKING STATION WILL BE LESS THAN THE INPUT REQUIREMENT, | STR70056 |
| 57 | C | | STR70057 |
| 58 | C | D;PROVIDE THESE ABOVE STATED TIME INTERVALS IN OUTPUT FORMAT; | STR70058 |
| 59 | C | | STR70059 |
| 60 | C | E;PROVIDE THE CAPABILITY FOR MULTIPLE CASE RUNS WITH VARYING | STR70060 |
| 61 | C | RELEASE POINTS AND DRIFF RATES; | STR70061 |
| 62 | C | | STR70062 |
| 63 | C | F;COMBINE THESE ABOVE STATED TIME INTERVALS ON A DAILY BASIS; | STR70063 |
| 64 | C | AS TO DEFINE A DAILY TIME PERIOD FOR WHICH ALL CONSTRAINTS | STR70064 |
| 65 | C | WILL BE MET FOR ALL TRACKING STATIONS SIMULTANEOUSLY, | STR70065 |
| 66 | C | | STR70066 |
| 67 | C | G;CREATE A PLOT OF THESE COMBINED DAILY RELEASE WINDOWS; | STR70067 |
| 68 | C | | STR70068 |
| 69 | C | | STR70069 |

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| 70 | C | THE PROGRAM HAS THE FOLLOWING OPTIONS... | STRTO0070 |
| 71 | C | | STRTO0071 |
| 72 | C | A; UP TO TWELVE FIXED TRACKING STATIONS MAY BE INPUT, | STRTO0072 |
| 73 | C | | STRTO0073 |
| 74 | C | B; IF A MOVING OR AIRCRAFT TRACKING STATION IS INPUT, THEN | STRTO0074 |
| 75 | C | THE MAXIMUM NUMBER OF FIXED STATIONS ALLOWED IS ELEVEN, THE | STRTO0075 |
| 76 | C | POSITION OF THE MOVING STATION AT RELEASE TIME AND AT HALF | STRTO0076 |
| 77 | C | HOURLY INCREMENTS INTO THE EXPERIMENTAL PERIOD MUST BE INPUT, | STRTO0077 |
| 78 | C | | STRTO0078 |
| 79 | C | C; A MAXIMUM OF THREE HOURS FOR THE EXPERIMENTAL PERIOD MAY BE | STRTO0079 |
| 80 | C | USED IN INCREMENTS OF ONE HALF HOUR, | STRTO0080 |
| 81 | C | | STRTO0081 |
| 82 | C | D; NOMINAL VALUES FOR PROGRAM CALCULATION DATE PERIOD, GENERAL | STRTO0082 |
| 83 | C | PROGRAM OPTIONS, TRACKING STATIONS AND RELEASE POINT | STRTO0083 |
| 84 | C | COORDINATES, AND THE VALUES FOR THE CONSTRAINTS CAN BE PRESET, | STRTO0084 |
| 85 | C | | STRTO0085 |
| 86 | C | E; THE GENERAL OPTIONS FOR THE PROGRAM CONSIST OF THE | STRTO0086 |
| 87 | C | FOLLOWING... | STRTO0087 |
| 88 | C | | STRTO0088 |
| 89 | C | 1; PERFORM THE PROGRAM CALCULATIONS, | STRTO0089 |
| 90 | C | | STRTO0090 |
| 91 | C | 2; CREATE A TAPE ON FILE 12 TO STORE THE SUN AND MOON DAILY | STRTO0091 |
| 92 | C | TIME INTERVALS FOR THE GIVEN TRACKING STATIONS OR USE AN | STRTO0092 |
| 93 | C | EXISTING TAPE READ IN ON TAPE FILE 12 IN ORDER TO SKIP | STRTO0093 |
| 94 | C | THESE CALCULATIONS, | STRTO0094 |
| 95 | C | | STRTO0095 |
| 96 | C | 3; CREATE A TAPE ON FILE 07 OF THE DAILY TIME INTERVALS | STRTO0096 |
| 97 | C | FOUND FOR EACH CONSTRAINT AND FOR EACH STATION AND/OR | STRTO0097 |
| 98 | C | PRINT AN EXISTING TAPE THROUGH FILE 07? | STRTO0098 |
| 99 | C | | STRTO0099 |
| 100 | C | 4; CREATE A TAPE ON FILE 09 OF THE COMBINED DAILY RELEASE | STRTO0100 |
| 101 | C | WINDOWS AND/OR PRINT AN EXISTING TAPE THROUGH FILE 09? | STRTO0101 |
| 102 | C | | STRTO0102 |
| 103 | C | 5; CREATE A TAPE FOR PLOTTING FROM THE DATA ON TAPE FILE 09 | STRTO0103 |
| 104 | C | OR NOT, | STRTO0104 |
| 105 | C | | STRTO0105 |
| 106 | C | | STRTO0106 |
| 107 | C | THE FORMAT OF THIS MAIN PROGRAM IS TO ... | STRTO0107 |
| 108 | C | | STRTO0108 |
| 109 | C | A; READ THE INPUTS; | STRTO0109 |
| 110 | C | B; PERFORM PROGRAM CALCULATIONS TO YIELD THE PROGRAM CONSTANTS | STRTO0110 |
| 111 | C | | STRTO0111 |
| 112 | C | C; CALCULATE THE PARAMETERS FOR THE CONSTRAINTS NOT DEPENDENT | STRTO0112 |
| 113 | C | UPON TIME, | STRTO0113 |
| 114 | C | | STRTO0114 |
| 115 | C | D; FIND THE TIME INTERVALS FOR EACH CONSTRAINT AND STORE ON A | STRTO0115 |
| 116 | C | DAILY BASIS; | STRTO0116 |
| 117 | C | | STRTO0117 |
| 118 | C | E; PROVIDE THE REQUESTED PRINTED OUTPUT AND/OR PLOT TAPE? | STRTO0118 |
| 119 | C | | STRTO0119 |
| 120 | C | F; REPEAT A THROUGH E FOR MULTIPLE CASE RUNS, | STRTO0120 |
| 121 | C | IN SELECTING THE OPTION NOT TO CALCULATE THEN B, C, AND D ARE | STRTO0121 |
| 122 | C | OMITTED; FOR DETAILED EXPLANATION OF ENTIRE PROGRAM FUNCTIONS | STRTO0122 |
| 123 | C | SEE THE COMMENTS AVAILABLE WITH EACH SUBROUTINE, | STRTO0123 |
| 124 | C | | STRTO0124 |
| 125 | C | | STRTO0125 |
| 126 | C | *****SYSTEMS INPUT FILES- | STRTO0126 |
| 127 | C | | STRTO0127 |
| 128 | C | FILE 05 - CARD READER | STRTO0128 |
| 129 | C | | STRTO0129 |
| 130 | C | FILE 07 - IF OPTION *ICALCV = 1 AND *IPRT7 = 0 | STRTO0130 |
| 131 | C | | STRTO0131 |
| 132 | C | FILE 09 - IF OPTION *ICALCV = 1 AND *IPRT9 = 0 | STRTO0132 |
| 133 | C | | STRTO0133 |
| 134 | C | FILE 11 - IF OPTION *IPRT11 = 0 1 | STRTO0134 |
| 135 | C | | STRTO0135 |
| 136 | C | | STRTO0136 |
| 137 | C | *****SYSTEMS OUTPUT FILES- | STRTO0137 |
| 138 | C | | STRTO0138 |
| 139 | C | FILE 03 - IF *IPLOT1 = 0, *XNOTE TAPE FILE 01 MUST BE RECORDED AT | STRTO0139 |
| 140 | C | 500 BPI) | STRTO0140 |
| 141 | C | | STRTO0141 |
| 142 | C | FILE 06 - PRINTER | STRTO0142 |

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| 183 | C | CONTAINS DATA FROM FILE 07 IF IPRY7 = 0 | STRT0843 |
| 184 | C | CONTAINS DATA FROM FILE 09 IF IPRY9 = 0 | STRT0844 |
| 185 | C | | STRT0845 |
| 186 | C | FILE 07 = IF IICLCV = 0 | STRT0846 |
| 187 | C | | STRT0847 |
| 188 | C | FILE 09 = IF IICLCV = 0 | STRT0848 |
| 189 | C | | STRT0849 |
| 190 | C | FILE 11 = IF IIPRY11 = 0 | STRT0850 |
| 191 | C | | STRT0851 |
| 192 | C | | STRT0852 |
| 193 | C | *****ADDITIONAL SYSTEMS FILES* | STRT0853 |
| 194 | C | | STRT0854 |
| 195 | C | FILE 11 = FOR MORE THAN 1 CASE WITHIN JOB RUN, | STRT0855 |
| 196 | C | | STRT0856 |
| 197 | C | FILE 12 = FOR MORE THAN 1 CASE WITHIN JOB RUN, | STRT0857 |
| 198 | C | | STRT0858 |
| 199 | C | FILE 13 = ALWAYS REQUIRED, | STRT0859 |
| 200 | C | | STRT0860 |
| 201 | C | | STRT0861 |
| 202 | C | *****INPUT* | STRT0862 |
| 203 | C | | STRT0863 |
| 204 | C | IICLCV - INTEGER CODE TO SIGNAL IF PROGRAM CALCULATIONS | STRT0864 |
| 205 | C | -ARE REQUESTED | STRT0865 |
| 206 | C | -00: PERFORM PROGRAM CALCULATIONS | STRT0866 |
| 207 | C | -01: DO NOT PERFORM PROGRAM CALCULATIONS | STRT0867 |
| 208 | C | | STRT0868 |
| 209 | C | IPRY7 - INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07 | STRT0869 |
| 210 | C | -00: PRINT FILE 07 DATA | STRT0870 |
| 211 | C | -01: DO NOT PRINT FILE 07 DATA | STRT0871 |
| 212 | C | | STRT0872 |
| 213 | C | IPRY9 - INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09 | STRT0873 |
| 214 | C | -DATA | STRT0874 |
| 215 | C | -00: PRINT FILE 09 DATA | STRT0875 |
| 216 | C | -01: DO NOT PRINT FILE 09 DATA | STRT0876 |
| 217 | C | | STRT0877 |
| 218 | C | IPRY11 - INTEGER CODE TO SIGNAL REQUEST CREATING FILE 11 | STRT0878 |
| 219 | C | -DATA | STRT0879 |
| 220 | C | -00: DO NOT CREATE FILE 11 TAPES USE EXISTING INPUT | STRT0880 |
| 221 | C | -TAPES ON FILE 11 | STRT0881 |
| 222 | C | -01: CREATE FILE 11 TAPES | STRT0882 |
| 223 | C | -02: DO NOT USE FILE 11 | STRT0883 |
| 224 | C | | STRT0884 |
| 225 | C | IICASE - CASE NUMBER (INTEGER) | STRT0885 |
| 226 | C | | STRT0886 |
| 227 | C | IFINAL - INTEGER CODE TO DESIGNATE LAST INPUT CASE | STRT0887 |
| 228 | C | -00: MORE CASES TO FOLLOW | STRT0888 |
| 229 | C | -01: NO MORE CASES | STRT0889 |
| 230 | C | | STRT0890 |
| 231 | C | DJUL - JULIAN DATE FOR CURRENT DATA | STRT0891 |
| 232 | C | | STRT0892 |
| 233 | C | NDFJD - NUMBER OF DAYS FROM EPOCH DATE TO DATE FOR | STRT0893 |
| 234 | C | -STARTING CALCULATIONS (INTEGER) | STRT0894 |
| 235 | C | | STRT0895 |
| 236 | C | NDFJE - NUMBER OF DAYS FROM EPOCH DATE TO DATE FOR | STRT0896 |
| 237 | C | -STOPPING CALCULATIONS (INTEGER) | STRT0897 |
| 238 | C | | STRT0898 |
| 239 | C | EPOCH - JULIAN DATE OF JANUARY 6 OF YEAR DATA BEGINS ON | STRT0899 |
| 240 | C | -FILE 09 | STRT0900 |
| 241 | C | | STRT0901 |
| 242 | C | RVS - RADIAL DISTANCE FROM EARTH CENTER TO RELEASE | STRT0902 |
| 243 | C | -POINT (RVS) | STRT0903 |
| 244 | C | | STRT0904 |
| 245 | C | DRIFT - THE SPACEFIXED DRIFT OF CLOUD (DEG/HR) | STRT0905 |
| 246 | C | | STRT0906 |
| 247 | C | R(2) - ELEVATION CONSTRAINT (RADIAN) | STRT0907 |
| 248 | C | | STRT0908 |
| 249 | C | R(6) - CLOUD DRIFT RATE (RADIAN/HR) | STRT0909 |
| 250 | C | | STRT0910 |
| 251 | C | R(7) - MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS) | STRT0911 |
| 252 | C | | STRT0912 |
| 253 | C | NS - THE NUMBER OF STATIONS USED IN THE PROGRAM | STRT0913 |
| 254 | C | | STRT0914 |
| 255 | C | NOB(12) - AN ARRAY CONTAINING THE STATION NUMBERS USED | STRT0915 |

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| 216 | C | | | STRT0216 |
| 217 | C | RTN | -CONVERSION FACTOR FROM RADIANS TO HOURS | STRT0217 |
| 218 | C | | | STRT0218 |
| 219 | C | HTN | -CONVERSION FACTOR FROM HOURS TO RADIANS | STRT0219 |
| 220 | C | | | STRT0220 |
| 221 | C | SUHL | -MEAN LONGITUDE OF THE SUN AT 0 HRS,UT, | STRT0221 |
| 222 | C | | | STRT0222 |
| 223 | C | GHA | -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS | STRT0223 |
| 224 | C | | -UNIVERSAL TIME (HRS) | STRT0224 |
| 225 | C | | | STRT0225 |
| 226 | C | SHADOW | -RADIUS OF EARTH SHADOW REGION (RADIANS) | STRT0226 |
| 227 | C | | | STRT0227 |
| 228 | C | GAMMA | -COSINE OF 'SHADOW' | STRT0228 |
| 229 | C | | | STRT0229 |
| 230 | C | | | STRT0230 |
| 231 | C | *****OUTPUT* | | STRT0231 |
| 232 | C | | | STRT0232 |
| 233 | C | WINDOW(1,5,12) | -THE DAILY RELEASE WINDOW START/STOP TIMES, | STRT0233 |
| 234 | C | | -1ST INDEX FOR STORING START/STOP TIMES, | STRT0234 |
| 235 | C | | -16875 FOR START TIMES | STRT0235 |
| 236 | C | | -26475 FOR STOP TIMES | STRT0236 |
| 237 | C | | -2ND INDEX FOR THE CONSTRAINT | STRT0237 |
| 238 | C | | - 1-EARTH SHADOW | STRT0238 |
| 239 | C | | - 2-ELEVATION | STRT0239 |
| 240 | C | | - 3-MON | STRT0240 |
| 241 | C | | - 4-MOON | STRT0241 |
| 242 | C | | - 5-TOTAL SKY BACKGROUND BRIGHTNESS | STRT0242 |
| 243 | C | | -3RD INDEX FOR THE STATION NUMBER | STRT0243 |
| 244 | C | | | STRT0244 |
| 245 | C | *****RESTRICTIONS- | | STRT0245 |
| 246 | C | THOSE ALREADY NOTED UNDER METHOD:DETAILED RESTRICTIONS ON | | STRT0246 |
| 247 | C | VARIOUS PHASES OF THE PROGRAM DEFINITION ARE NOTED IN EACH | | STRT0247 |
| 248 | C | SUBROUTINE, | | STRT0248 |
| 249 | C | | | STRT0249 |
| 250 | C | *****SUBPROGRAMS REQUIRED- | | STRT0250 |
| 251 | C | BLCK DTA | | STRT0251 |
| 252 | C | INPRT | | STRT0252 |
| 253 | C | NGCARD | | STRT0253 |
| 254 | C | INPRT | | STRT0254 |
| 255 | C | CONVER | | STRT0255 |
| 256 | C | DAYRUM | | STRT0256 |
| 257 | C | QDTBGC | | STRT0257 |
| 258 | C | TIME | | STRT0258 |
| 259 | C | ELNSR | | STRT0259 |
| 260 | C | ELVDFT | | STRT0260 |
| 261 | C | AIRGL | | STRT0261 |
| 262 | C | ERAIR | | STRT0262 |
| 263 | C | SUNHN | | STRT0263 |
| 264 | C | ILGUM | | STRT0264 |
| 265 | C | LTNG | | STRT0265 |
| 266 | C | GE2YC | | STRT0266 |
| 267 | C | RDEPH | | STRT0267 |
| 268 | C | | EPHERMERIS TABLES | STRT0268 |
| 269 | C | NLIST | | STRT0269 |
| 270 | C | GETOI | | STRT0270 |
| 271 | C | TRASK | | STRT0271 |
| 272 | C | STRCLT | | STRT0272 |
| 273 | C | ZHDCLT | | STRT0273 |
| 274 | C | | ITE | STRT0274 |
| 275 | C | | ZYABLE | STRT0275 |
| 276 | C | OUY1 | | STRT0276 |
| 277 | C | CXLBAT | | STRT0277 |
| 278 | C | YTLWDO | | STRT0278 |
| 279 | C | ICAB | | STRT0279 |
| 280 | C | OUY2 | | STRT0280 |
| 281 | C | TCTYPE | | STRT0281 |
| 282 | C | ODTYPE | | STRT0282 |
| 283 | C | DAYRUM | | STRT0283 |
| 284 | C | PLTRTN | | STRT0284 |
| 285 | C | HBPLOT | | STRT0285 |
| 286 | C | | DATE | STRT0286 |
| 287 | C | | CALDNR | STRT0287 |
| 288 | C | | MOCALD | STRT0288 |


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289 C PLOT START0289
290 C START0290
291 C *****END OF DOCUMENTATION CARDS***** START0291
292 C START0292
293 COMMON/BLK1 /KMONTH,NDAY ,RYEAR ,LMONTH,LDAY ,LYEAR ,KMO, RDA, START0293
294 1 KVR, LMOY LNA, LTR, ICALC, IPRTY, IPRT9, IPRT21, IPLOT START0294
295 COMMON/BLK2 /DJUL, NDPJ0, NDYE, EP0CH START0295
296 COMMON/BLK3 /SINCLY, COSCLY, SINCLN, COSCLN, RVC START0296
297 COMMON/BLK4 /DRIFT START0297
298 COMMON/BLK5 /R(6) START0298
299 COMMON/BLK6 /NS, NOS(12) START0299
300 COMMON/BLK7 /NAME(3*12), PH1(12), LAMBDA(12), ALT(12), MOVE(12) START0300
301 COMMON/BLK8 /DYN, RYD, MYR, HALP01, RTH, AU, DELTA(4), ERM, BGWA START0301
302 COMMON/BLK9 /SUNL, SNA START0302
303 COMMON/BLK10 /WINDOW(6*5*12) START0303
304 COMMON/BLK11 /ICASE, IFINAL START0304
305 COMMON/BLK12 /SHADOW START0305
306 COMMON/BLK13 /LINE, IYBAR, INOYE, IDAY START0306
307 DOUBLE PRECISION DYN, RYD, MYR, HALP01 START0307
308 REAL LAMBDA START0308
309 DATA ENDPIC/999.0/ START0309
310 ARCSIN(X) = ATAN(X/SQR(1.0-X**2)) START0310
311 C PROGRAM STARTS HERE START0311
312 C START0312
313 C READ AND WRITE INPUTS START0313
314 1 CALL INPUT START0314
315 C CHANGE FILE15 CODE TO HAVE ABILITY TO USE SUN AND MOON DATA WITH START0315
316 C STACKED CASES? START0316
317 IF (ICASE.EQ.1) GO TO 2 START0317 2
318 IF (IFINAL.EQ.0) IPRT10=1 START0318 9
319 2 IF (ICASE.EQ.2) IPRT21=0 START0319 8
320 CALL INPUT START0320 11
321 C START0321
322 IF (ICALC.EQ.1) GO TO 21 START0322 12
323 C CONVERT INPUTS TO REQUIRED UNITS AND PERFORM THE ONE-TIME CALCULATIONS START0323
324 CALL CONVER START0324 15
325 C WRITE EPOCH DATE ON FILE 9 START0325
326 IF (ICASE.EQ.1) WRITE (9,1084) EP0CH START0326 16
327 C CHECK FOR EACH TRACKING STATION'S ELEVATION ANGLE TO INSURE IT BEING START0327
328 C GREATER THAN R(2) START0328
329 CALL BL ENR START0329 21
330 C FOR EARTH SHADOW FIND THE TIME CORRECTION FOR CLOUD DRIFT DURING START0330
331 C TRACKING PERIOD START0331
332 DRIFT = (R(4) + 1.0*MYR) * RZER(5) START0332 22
333 C START0333
334 C SHADOW COMPUTATIONS START0334
335 C START0335
336 C THETA IS THE ANGLE BETWEEN THE EARTH-SUN LINE AND START0336
337 C THE VANGENCY POINT OF THE REMUMERA CONE START0337
338 C START0338
339 C THE MAXIMUM VALUE OF THETA IS APPROX: 89 DEG 45 MIN, START0339
340 C OR PI/2 MINUS THETA IS 1.06436332 RADIAN START0340
341 C START0341
342 C COMPUTE THE RADIUS OF THE SHADOW IN RADIAN START0342
343 SHADOW = ARCSIN( 1.87RV6) + 1.06436332 START0343 23
344 C START0344
345 C COMPUTE AIRGLOW BRIGHTNESS START0345
346 CALL AIRGLU START0346 24
347 C START0347
348 C COMPUTE START-STOP TIMES FOR SUN AND MOON ON DAY PRIOR TO DAY 2 START0348
349 IDAY =NDPJ0 -1 START0349 29
350 SNA =TIME(DJUL-1.) START0350 26
351 IF (IPRT21.EQ.0) GO TO 31 START0351 27
352 DO 200 M=3,4 START0352 30
353 CALL SUNRN (IDAY,M) START0353 31
354 C TRANSFORM SECOND SUN AND MOON INTERVALS TO FIRST INTERVALS FOR NEXT START0354
355 C DAY START0355
356 DO 200 L=1,NS START0356 32
357 N =NOS(L) START0357 33
358 WINDOW(1,M,N) =WINDOW(3,M,N) + 24*0 START0358 34
359 200 WINDOW(2,M,N) =WINDOW(4,M,N) + 24*0 START0359 35
360 C PERFORM CALCULATIONS AND CREATE OUTPUT FILES ON A DAILY BASIS FOR DATE START0360
361 C PERIOD REQUESTED, START0361
362 11 DO 100 I = NDPJ0,NDYE START0362 38

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| 363 | C CALCULATE ANTERION HOUR ANGLE FOR CURRENT DATE | STR0363 | |
| 364 | DTE = DTRE(2,JUL) | STR0364 | 39 |
| 365 | C COMPUTE GROUND THROUGH CONSTRAINT ON RELEASE POINT | STR0365 | |
| 366 | CALL BLTDR (1) | STR0366 | 40 |
| 367 | C STORE WARM WINDON RESULTS IN OUTPUT ARRAY AND EXECUTE PRINT | STR0367 | |
| 368 | IDAY = 1 | STR0368 | 41 |
| 369 | CALL BUTS (1) | STR0369 | 42 |
| 370 | C COMPUTE SUN AND MOON START-STOP TIMES FOR CURRENT DAY | STR0370 | |
| 371 | DO 388 M=3,4 | STR0371 | 43 |
| 372 | IF (IPRTS17E,0) GO TO 32 | STR0372 | 44 |
| 373 | CALL SUNMN (1,M) | STR0373 | 47 |
| 374 | DO 388 NN=1,NS | STR0374 | 48 |
| 375 | N = NOS(NR) | STR0375 | 49 |
| 376 | IF (IPRTS17E,2) GO TO 33 | STR0376 | 50 |
| 377 | WRITE (11,1002) DJUL, (WINDOW(L,M,N),L=1,4) | STR0377 | 53 |
| 378 | C SUBTRACT OFF TRACKING PERIOD FROM SUN AND MOON STOP TIMES ONLY FOR | STR0378 | |
| 379 | C THE GROUND STATIONS: | STR0379 | |
| 380 | 33 IF (MOVE(N),NE,0) GO TO 500 | STR0380 | 59 |
| 381 | WINDOW(2,M,N) = WINDOW(2,M,N) - R(7) | STR0381 | 62 |
| 382 | WINDOW(4,M,N) = WINDOW(4,M,N) - R(7) | STR0382 | 63 |
| 383 | 500 CONTINUE | STR0383 | 64 |
| 384 | GO TO 388 | STR0384 | 66 |
| 385 | C READ SUN AND MOON START/STOP TIMES FROM TAPR FILE 11 | STR0385 | |
| 386 | 32 DO 600 NN=1,NS | STR0386 | 67 |
| 387 | N = NOS(NR) | STR0387 | 68 |
| 388 | READ (11,1002) DTE, (WINDOW(L,M,N),L=1,4) | STR0388 | 69 |
| 389 | C SUBTRACT OFF TRACKING PERIOD FROM SUN AND MOON STOP TIMES ONLY FOR | STR0389 | |
| 390 | C THE GROUND STATIONS: | STR0390 | |
| 391 | IF (MOVE(N),NE,0) GO TO 600 | STR0391 | 79 |
| 392 | WINDOW(2,M,N) = WINDOW(2,M,N) - R(7) | STR0392 | 78 |
| 393 | WINDOW(4,M,N) = WINDOW(4,M,N) - R(7) | STR0393 | 79 |
| 394 | 600 CONTINUE | STR0394 | 80 |
| 395 | C WRITE ERROR MESSAGE IF DATE ON TAPR FILE 11 DOES NOT MATCH FOR CURRENT | STR0395 | |
| 396 | C DATA BEING CALCULATED, | STR0396 | |
| 397 | IF (DJUL,0,DTE) GO TO 388 | STR0397 | 82 |
| 398 | WRITE (11,1003) | STR0398 | 89 |
| 399 | STOP | STR0399 | 87 |
| 400 | C STORE SUN/MOON RESULTS IN OUTPUT LOCATIONS AND EXECUTE PRINT OUTPUT | STR0400 | |
| 401 | 388 CALL BUTS (M) | STR0401 | 88 |
| 402 | C CALCULATE TIME INTERVALS FOR TOTAL SUN BACKGROUND BRIGHTNESS | STR0402 | |
| 403 | C CONSTRAINT, | STR0403 | |
| 404 | CALL BLTDR | STR0404 | 90 |
| 405 | C STORE RESULTS IN OUTPUT LOCATIONS AND EXECUTE OUTPUT PRINTING | STR0405 | |
| 406 | CALL BUTS (5) | STR0406 | 91 |
| 407 | C CALCULATE COMBINED RELEASE POINT FOR CURRENT DAY | STR0407 | |
| 408 | CALL YLRDB (1) | STR0408 | 92 |
| 409 | C UPDATE JULIAN DATE AND MEAN LONGITUDE OF SUN FOR NEXT DAY | STR0409 | |
| 410 | DJUL = DJUL + 1.0 | STR0410 | 93 |
| 411 | SUNL = AMOD((SUNL + 0.99856471,360.7) | STR0411 | 94 |
| 412 | C TRANSFORM SECOND SUN AND MOON INTERVALS TO FIRST INTERVALS FOR NEXT | STR0412 | |
| 413 | C DAY, ADD BACK IN THE TRACKING TIME ON THE STOP TIMES FOR FIXED | STR0413 | |
| 414 | C STATIONS ONLY: | STR0414 | |
| 415 | DO 408 M=3,4 | STR0415 | 95 |
| 416 | DO 408 L=1,NS | STR0416 | 96 |
| 417 | N = NOS(L) | STR0417 | 97 |
| 418 | WINDOW(1,M,N) = WINDOW(3,M,N) + 24.0 | STR0418 | 98 |
| 419 | IF (MOVE(N),EO,0) GO TO 14 | STR0419 | 99 |
| 420 | WINDOW(2,M,N) = WINDOW(4,M,N) + 24.0 | STR0420 | 102 |
| 421 | GO TO 408 | STR0421 | 103 |
| 422 | 14 WINDOW(2,M,N) = WINDOW(4,M,N) + R(7) + 24.0 | STR0422 | 104 |
| 423 | 408 CONTINUE | STR0423 | 105 |
| 424 | 108 CONTINUE | STR0424 | 108 |
| 425 | C COMPLETED COMPUTATION OF PRESENT CASE? | STR0425 | |
| 426 | REWIND 11 | STR0426 | 110 |
| 427 | WRITE (11,1008) ENDFIL | STR0427 | 111 |
| 428 | C COMPUTE NEXT CASE, IF ANY | STR0428 | |
| 429 | 31 IF (IPINEL,EO,0) GO TO 1 | STR0429 | 114 |
| 430 | IF (IHAL,EO,0) WRITE (11,1001) ENDFIL | STR0430 | 117 |
| 431 | C REWIND THESE FILES IF REQUESTING THEM PRINTING, | STR0431 | |
| 432 | IF (IPRT7,EO,0) REWIND 87 | STR0432 | 122 |
| 433 | IF (IPRT9,EO,0) REWIND 89 | STR0433 | 125 |
| 434 | C EXECUTE OUTPUT PRINTING AND GENERATING PLOT TAPR ROUTINE, | STR0434 | |

| | | |
|-----|--|-------------|
| 435 | CALL OUY2 | STR0635 828 |
| 436 | STOP | STR0636 829 |
| 437 | 2000 FORMAT (P10;2;120X) | STR0637 830 |
| 438 | 2001 FORMAT (P10;2;9X;120X) | STR0638 830 |
| 439 | 2002 FORMAT (P10;2;9X;120X) | STR0639 830 |
| 440 | 2003 FORMAT (P10;2;9X;120X) | STR0640 830 |
| 441 | 1 TIMES FROM TAPE 11-PROGRAM TERMINATED) | STR0641 |
| 442 | 2004 FORMAT (P10;2) | STR0642 830 |
| 443 | END | STR0643 830 |

26843 WORDS OF MEMORY USED BY THIS COMPILEATION

07406 01 09-25-72 11.385

WANTON WINDOW MAIN PROGRAM

*****0740601.8;1635 B10WINDOW MAIN PROGRAM*****

PREPAGE

PROGRAM BREAK 1028
COMMON LENGTH 8
V COUNT BITS 6

PRIMARY SYNDROP ENTRY

..... 8

SECONDARY SYNDROP ENTRY

| BLOCK | LENGTH |
|---------|--------|
| 1 BLKS | 28 |
| 2 BLKS1 | 4 |
| 3 BLKS1 | 9 |
| 4 BLKS4 | 8 |
| 5 BLKS1 | 10 |
| 6 BLKS | 19 |
| 7 BLKS | 124 |
| 10 BLKS | 26 |
| 11 BLKS | 2 |
| 12 BLKS | 556 |
| 13 BLKS | 2 |
| 14 BLKS | 2 |
| 15 BLKS | 4 |

SYNREF

16 ATAN
17 OUY2
20 OUY2
21 SQRT
22 TIME
23 ILLUM
24 INPRY
25 INPRY
26 NLTYE
27 SUBRN
30 ATRALO
31 CONVEN
32 ELENSH
33 PERV.
34 PRETY
35 PERL.
36 PERD.
37 PERV.
40 PERY.
41 PERD.
42 TLENDU

1023 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JHPA 050174/052371 JHBB 050171/052371 JHPC 050174/052371

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

49 1974P WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY.

07000 01 09-09-72 11,998 NOMINAL INPUTS AND PROGRAM CONSTANTS

*****BLOCK DATA SUBPROGRAM*****

| | | | | |
|----|---|---|--|----------|
| 1 | C | DATA | NOMINAL INPUTS AND PROGRAM CONSTANTS | DATA0001 |
| 2 | C | *****BLOCK DATA SUBPROGRAM***** | | DATA0002 |
| 3 | C | | | DATA0003 |
| 4 | C | *****START OF DOCUMENTATION CARDS***** | | DATA0004 |
| 5 | C | | | DATA0005 |
| 6 | C | *****NABA HALLOPS VERSION OF 02/01/70 | | DATA0006 |
| 7 | C | | | DATA0007 |
| 8 | C | *****LANGUAGE-FORTRAN IV | | DATA0008 |
| 9 | C | | | DATA0009 |
| 10 | C | *****MACHINE-GE 625 | | DATA0010 |
| 11 | C | | | DATA0011 |
| 12 | C | *****PURPOSE. | | DATA0012 |
| 13 | C | TO DEFINE NOMINAL INPUT PARAMETERS AND TO DEFINE CONVERSION | | DATA0013 |
| 14 | C | FACTORS FOR USE IN THE BT-WINROW PROGRAM, | | DATA0014 |
| 15 | C | | | DATA0015 |
| 16 | C | *****METHOD- | | DATA0016 |
| 17 | C | DEFINE CONSTANTS AND NOMINAL PARAMETERS THROUGH DATA STATEMENTS | | DATA0017 |
| 18 | C | | | DATA0018 |
| 19 | C | | | DATA0019 |
| 20 | C | *****INPUTS | | DATA0020 |
| 21 | C | | | DATA0021 |
| 22 | C | NOISE | | DATA0022 |
| 23 | C | | | DATA0023 |
| 24 | C | | | DATA0024 |
| 25 | C | *****OUTPUT- | | DATA0025 |
| 26 | C | | | DATA0026 |
| 27 | C | KMONTH | -MONTH NUMBER FOR STARTING CALCULATIONS | DATA0027 |
| 28 | C | | | DATA0028 |
| 29 | C | KDAY | -DAY NUMBER FOR STARTING CALCULATIONS | DATA0029 |
| 30 | C | | | DATA0030 |
| 31 | C | KYEAR | -YEAR NUMBER FOR STARTING CALCULATIONS | DATA0031 |
| 32 | C | | | DATA0032 |
| 33 | C | LMONTH | -MONTH NUMBER FOR STOPPING CALCULATIONS | DATA0033 |
| 34 | C | | | DATA0034 |
| 35 | C | LDAY | -DAY NUMBER FOR STOPPING CALCULATIONS | DATA0035 |
| 36 | C | | | DATA0036 |
| 37 | C | LYEAR | -YEAR NUMBER FOR STOPPING CALCULATIONS | DATA0037 |
| 38 | C | | | DATA0038 |
| 39 | C | KMB | -MONTH PLOTTING AND/OR PRINTING TO BEGIN | DATA0039 |
| 40 | C | | | DATA0040 |
| 41 | C | KDB | -DAY PLOTTING AND/OR PRINTING TO BEGIN | DATA0041 |
| 42 | C | | | DATA0042 |
| 43 | C | KYR | -YEAR PLOTTING AND/OR PRINTING TO BEGIN | DATA0043 |
| 44 | C | | | DATA0044 |
| 45 | C | LMB | -MONTH PLOTTING AND/OR PRINTING TO END | DATA0045 |
| 46 | C | | | DATA0046 |
| 47 | C | LDB | -DAY PLOTTING AND/OR PRINTING TO END | DATA0047 |
| 48 | C | | | DATA0048 |
| 49 | C | LYR | -YEAR PLOTTING AND/OR PRINTING TO END | DATA0049 |
| 50 | C | | | DATA0050 |
| 51 | C | ICALC | -INTEGER CODE TO SIGNAL IF PROGRAM CALCULATIONS | DATA0051 |
| 52 | C | | ARE REQUESTED | DATA0052 |
| 53 | C | 00 | PERFORM PROGRAM CALCULATIONS | DATA0053 |
| 54 | C | 01 | DO NOT PERFORM PROGRAM CALCULATIONS | DATA0054 |
| 55 | C | | | DATA0055 |
| 56 | C | IPRT7 | -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07 | DATA0056 |
| 57 | C | | 00:PRINT FILE 07 DATA | DATA0057 |
| 58 | C | | 01:DO NOT PRINT FILE 07 DATA | DATA0058 |
| 59 | C | | | DATA0059 |
| 60 | C | IPRT9 | -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09 | DATA0060 |
| 61 | C | | 00:PRINT FILE 09 DATA | DATA0061 |
| 62 | C | | 01:DO NOT PRINT FILE 09 DATA | DATA0062 |
| 63 | C | | | DATA0063 |
| 64 | C | | | DATA0064 |
| 65 | C | IPRT11 | -INTEGER CODE TO SIGNAL REQUEST CREATING FILE 11 | DATA0065 |
| 66 | C | | 00:CREATE FILE 11 TAPE | DATA0066 |
| 67 | C | | 01:DO NOT CREATE FILE 11 TAPE USE EXISTING INPUT | DATA0067 |
| 68 | C | | TAPE ON FILE 10 | DATA0068 |
| 69 | C | | | DATA0069 |

| | | | | |
|-----|---|------------|---|----------|
| 70 | C | | -#2: DO NOT USE STYLE 11 | DATA0070 |
| 71 | C | | | DATA0071 |
| 72 | C | IPLOT | -INTEGER CODE TO SIGNAL REQUEST PLOTTING DATA | DATA0072 |
| 73 | C | | -#3: CREATE A TAPE FOR PLOTTING DATA FOR 8 | DATA0073 |
| 74 | C | | - CALENDAR YEARS THROUGH FILE 01 AT 550 BP | DATA0074 |
| 75 | C | | -#4: CREATE A TAPE FOR PLOTTING DATA FOR 8 | DATA0075 |
| 76 | C | | - CALENDAR MONTHS THROUGH FILE 01 AT 556 BP | DATA0076 |
| 77 | C | | -#5: DO NOT CREATE A PLOT TAPE | DATA0077 |
| 78 | C | | | DATA0078 |
| 79 | C | PHIPDO | -GEODEVIC LATITUDE OF RELEASE POINT (DEG) | DATA0079 |
| 80 | C | | | DATA0080 |
| 81 | C | LAMPDO | -LONGITUDE OF RELEASE POINT (DEG) | DATA0081 |
| 82 | C | | | DATA0082 |
| 83 | C | HEIGHT | -ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE | DATA0083 |
| 84 | C | | -(FEET) | DATA0084 |
| 85 | C | | | DATA0085 |
| 86 | C | RESTR(2) | -MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION | DATA0086 |
| 87 | C | | -TO THE RELEASE POINT (DEG) | DATA0087 |
| 88 | C | | | DATA0088 |
| 89 | C | RESTR(3) | -MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH | DATA0089 |
| 90 | C | | -TRACKING STATION (DEG) | DATA0090 |
| 91 | C | | | DATA0091 |
| 92 | C | RESTR(4) | -MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH | DATA0092 |
| 93 | C | | -TRACKING STATION (DEG) | DATA0093 |
| 94 | C | | | DATA0094 |
| 95 | C | RESTR(5) | -MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE | DATA0095 |
| 96 | C | | -RELEASE POINT AS SEEN FROM EACH TRACKING STATION | DATA0096 |
| 97 | C | | -(RAYLENGTH) | DATA0097 |
| 98 | C | | | DATA0098 |
| 99 | C | RESTR(6) | -CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD | DATA0099 |
| 100 | C | | -AFTER RELEASE RELATIVE TO THE EARTH (KM/SEC) | DATA0100 |
| 101 | C | | | DATA0101 |
| 102 | C | RESTR(7) | -MINIMUM TRACKING PERIOD REQUIRED (HRS) | DATA0102 |
| 103 | C | | | DATA0103 |
| 104 | C | RESTR(8) | -ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE | DATA0104 |
| 105 | C | | -RELATIVE TO THE EARTH (KM/SEC) | DATA0105 |
| 106 | C | | | DATA0106 |
| 107 | C | NS | -THE NUMBER OF STATIONS USED IN THE PROGRAM | DATA0107 |
| 108 | C | | | DATA0108 |
| 109 | C | NS(12) | -AN ARRAY CONTAINING THE STATION NUMBERS USED | DATA0109 |
| 110 | C | | | DATA0110 |
| 111 | C | NAME(3,12) | -NAME OF TRACKING STATIONS USED | DATA0111 |
| 112 | C | | | DATA0112 |
| 113 | C | PHI(12) | -GEODEVIC LATITUDE OF TRACKING STATION (DEG) | DATA0113 |
| 114 | C | | | DATA0114 |
| 115 | C | LAMBDA(12) | -LONGITUDE OF TRACKING STATION (DEG) | DATA0115 |
| 116 | C | | | DATA0116 |
| 117 | C | ALT(12) | -ALTITUDE OF TRACKING STATION ABOVE EARTH SURFACE | DATA0117 |
| 118 | C | | -(FEET) | DATA0118 |
| 119 | C | | | DATA0119 |
| 120 | C | MOVE(12) | -CODE NUMBER TO DETERMINE IF STATION COORDINATES | DATA0120 |
| 121 | C | | -ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT | DATA0121 |
| 122 | C | | -#0: FOR FIXED STATION | DATA0122 |
| 123 | C | | -#1: FOR AIRCRAFT | DATA0123 |
| 124 | C | | | DATA0124 |
| 125 | C | PNAME(3,7) | -ALPHANUMERIC DESCRIPTION FOR AIRCRAFT POSITION | DATA0125 |
| 126 | C | | -DURING TRACKING PERIOD | DATA0126 |
| 127 | C | | | DATA0127 |
| 128 | C | PLAT(7) | -GEODEVIC LATITUDE OF AIRCRAFT DURING | DATA0128 |
| 129 | C | | -EXPERIMENTAL PERIOD (DEG) | DATA0129 |
| 130 | C | | | DATA0130 |
| 131 | C | PLON(7) | -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD | DATA0131 |
| 132 | C | | -(DEG) | DATA0132 |
| 133 | C | | | DATA0133 |
| 134 | C | PALT(7) | -ALTITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD | DATA0134 |
| 135 | C | | -(FEET) | DATA0135 |
| 136 | C | | | DATA0136 |
| 137 | C | DTR | -CONVERSION FACTOR FROM DEGREES TO RADIANS | DATA0137 |
| 138 | C | | | DATA0138 |
| 139 | C | RTD | -CONVERSION FACTOR FROM RADIANS TO DEGREES | DATA0139 |
| 140 | C | | | DATA0140 |
| 141 | C | HTN | -CONVERSION FACTOR FROM HOURS TO RADIANS | DATA0141 |
| 142 | C | | | DATA0142 |

| | | | | |
|-----|---|---|--|----------|
| 183 | C | RTM | -CONVERSION FACTOR FROM RADIANS TO HOURS | DATA0243 |
| 184 | C | | | DATA0244 |
| 185 | C | AU | -CONVERSION FACTOR FROM ASTRONOMICAL UNITS TO | DATA0245 |
| 186 | C | | -EARTH RADII UNITS | DATA0246 |
| 187 | C | | | DATA0247 |
| 188 | C | DELTA(3) | -APPROXIMATE PERIOD OF SUN MOTION (HRS) | DATA0248 |
| 189 | C | | | DATA0249 |
| 190 | C | DELTA(4) | -APPROXIMATE PERIOD OF MOON MOTION (HRS) | DATA0250 |
| 191 | C | | | DATA0251 |
| 192 | C | ERM | -CONVERSION FACTOR FROM EARTH RADII UNITS TO | DATA0252 |
| 193 | C | | -KILOMETERS | DATA0253 |
| 194 | C | | | DATA0254 |
| 195 | C | HALFPT | -VALUE OF 90 DEGREES IN RADIANS | DATA0255 |
| 196 | C | | | DATA0256 |
| 197 | C | WINDOW(8,3,12) | -THE DAILY RELEASE WINDOW START/STOP TIMES, | DATA0257 |
| 198 | C | | -1ST INDEX FOR STORING START/STOP TIMES, | DATA0258 |
| 199 | C | | -19375 FOR START TIMES | DATA0259 |
| 200 | C | | -29476 FOR STOP TIMES | DATA0260 |
| 201 | C | | -2ND INDEX FOR THE CONSTRAINT | DATA0261 |
| 202 | C | | - 1:EARTH SHADOW | DATA0262 |
| 203 | C | | - 2:ELEVATION | DATA0263 |
| 204 | C | | - 3:SUN | DATA0264 |
| 205 | C | | - 4:MOON | DATA0265 |
| 206 | C | | - 5:TOTAL SKY BACKGROUND BRIGHTNESS | DATA0266 |
| 207 | C | | -3RD INDEX FOR LINE STATION NUMBER | DATA0267 |
| 208 | C | | | DATA0268 |
| 209 | C | LINE | -LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT | DATA0269 |
| 210 | C | | -HEADING | DATA0270 |
| 211 | C | | | DATA0271 |
| 212 | C | *****RESTRICTIONS- | | DATA0272 |
| 213 | C | NONE KNOWN | | DATA0273 |
| 214 | C | | | DATA0274 |
| 215 | C | *****SUBPROGRAMS REQUIRED- | | DATA0275 |
| 216 | C | NONE | | DATA0276 |
| 217 | C | | | DATA0277 |
| 218 | C | *****END OF DOCUMENTATION CARDS***** | | DATA0278 |
| 219 | C | | | DATA0279 |
| 220 | | BLOCK DATA | | DATA0280 |
| 221 | | REAL LAMRDS,LAMBDA | | DATA0281 |
| 222 | | COMMON/BLK1 /KMONTH,KDAY ,KYEAR ,LMONTH,LDAY ,LYEAR ,KMO,KDA, | | DATA0282 |
| 223 | | 1 KYR, LNO, LDA, LYR, ICALC, IPRT7, IPRT9, IPRT11, IPLOT | | DATA0283 |
| 224 | | COMMON/BLK2 /PHIPDG,LAMRDS,HEIGHT | | DATA0284 |
| 225 | | COMMON/BLK3 /RSTR(8) | | DATA0285 |
| 226 | | COMMON/BLK4 /NS, NOS(12) | | DATA0286 |
| 227 | | COMMON/BLK5 /NAME(3*12), PHT(12), LAMRDS(12), ALT(12), MOVE(12) | | DATA0287 |
| 228 | | COMMON/BLK6 /PNAME(3*7), PCAT(7), PLONG(7), PALT(7), JAIR | | DATA0288 |
| 229 | | COMMON/BLK7 /DTR, RYD, MYR, HALFPT, RTM, AU, DELTA(4), ERM, DGHA | | DATA0289 |
| 230 | | COMMON/BLK8 / WINDOW(6*3,12) | | DATA0290 |
| 231 | | COMMON/BLK9 / LINE, IYEAR, IMONTH, IDAY | | DATA0291 |
| 232 | | DOUBLE PRECISION DTR, RYD, MYR, HALFPT | | DATA0292 |
| 233 | | DATA KMONTH,KDAY ,KYEAR ,LMONTH,LDAY ,LYEAR / | | DATA0293 |
| 234 | | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 | | DATA0294 |
| 235 | | DATA KMO,KDA, KYR, LNO, LDA, LYR | | DATA0295 |
| 236 | | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 | | DATA0296 |
| 237 | | DATA ICALC, IPRT7, IPRT9, IPRT11, IPLOT | | DATA0297 |
| 238 | | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 | | DATA0298 |
| 239 | | DATA PHIPDG, LAMRDS, HEIGHT | | DATA0299 |
| 240 | | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 | | DATA0300 |
| 241 | | DATA RSTR /0.0, 30.0, -18.0, -21.0, 1.75, 0.0, 2.0, 2.4/ | | DATA0301 |
| 242 | | DATA (NAME(1:1)) PHIPDG(1), LAMRDS(1), ALT(1), PHT(1:12) | | DATA0302 |
| 243 | | 1 18000,CHILE -29.2668879,-70.7733883,7201.4 | | DATA0303 |
| 244 | | 2 18000,CHILE -35.2692949,-70.7733883,7891.8 | | DATA0304 |
| 245 | | 3 18000,CHILE -18.0668259,-71.7493326,8433.2 | | DATA0305 |
| 246 | | 4 18000,CHILE -32.42385,-106.759278,5413.46 | | DATA0306 |
| 247 | | 5 18000,CHILE -32.42385,-106.759278,5413.46 | | DATA0307 |
| 248 | | 6 18000,CHILE -32.42385,-106.759278,5413.46 | | DATA0308 |
| 249 | | 7 18000,CHILE -32.42385,-106.759278,5413.46 | | DATA0309 |
| 250 | | 8 18000,CHILE -32.42385,-106.759278,5413.46 | | DATA0310 |
| 251 | | DATA (MOVE(1:1),181.8)/ 800/ | | DATA0311 |
| 252 | | DATA (WINDOW(1:1,179(1:194)) / 0.0,0.0091,0.24,0/ | | DATA0312 |
| 253 | | DATA NS, (NOS(1),181.7) / 7.2,2.378,0.6,0/ | | DATA0313 |
| 254 | | DATA AU/0.0258676-4/ | | DATA0314 |
| 255 | | DATA HALFPT/1.5707963267948966198 61/ | | DATA0315 |
| 256 | | DATA DTR/2.74532925399432958051/ | | DATA0316 |

217 DATA RYM/81971863/
 218 DATA RYD/572957795130823209D 02/
 219 DATA RYM/361799388 D8/
 220 DATA DELTA /8.0 0.0 24.0 24.78/
 221 DATA BRN /4371.824/
 222 DATA DGMZ/X:60273791/
 223 DATA LINE/35/
 224 END

DATA0817
 DATA0818
 DATA0819
 DATA0820
 DATA0821
 DATA0822
 DATA0823
 DATA0824

23782 WORDS OF MEMORY USED BY THIS COMPILEATION

67906 01 09-25-72 11,598 NOMINAL INPUTS AND PROGRAM CONSTANTS

*****BLOCK DATA SUBPROGRAM*****

PREPAGE

PROGRAM BREAK 0
 COMMON LENGTH 0
 V ENTRY BITS 9

PRIMARY SYMDEF ENTRY

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

| | | |
|----|-------|-----|
| 1 | BLK8 | 28 |
| 2 | BLK8 | 8 |
| 3 | BLK8 | 16 |
| 4 | BLK8 | 18 |
| 5 | BLK8 | 124 |
| 6 | BLK84 | 93 |
| 7 | BLK8 | 20 |
| 10 | BLK8 | 558 |
| 11 | BLK8 | 4 |

SYNREF

0 IS THE NEXT AVAILABLE LOCATION.

GNAP VERSION/ASSEMBLY DATES JNPA 050171/0525X1 JMRB 050171/052571 J4PC 050171/052571
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
 ** 19255 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY.

67906 01 09-25-72 11,599 READ INPUT PARAMETERS

*****SUBROUTINE INPUT*****

| | | | |
|----|---|---|----------|
| 1 | CINRU | READ INPUT PARAMETERS | INPU0801 |
| 2 | C*****SUBROUTINE INPUT***** | | INPU0802 |
| 3 | C | | INPU0803 |
| 4 | C*****START OF DOCUMENTATION CARDS***** | | INPU0804 |
| 5 | C | | INPU0805 |
| 6 | C*****NAXA WALLOPS VERSION OF 02/01/70 | | INPU0806 |
| 7 | C | | INPU0807 |
| 8 | C*****LANGUAGE-FORTRAN IV | | INPU0808 |
| 9 | C | | INPU0809 |
| 10 | C*****MACHINE-GE 025 | | INPU0810 |
| 11 | C | | INPU0811 |
| 12 | C*****PURPOSE. | | INPU0812 |
| 13 | C | TO READ INPUT PARAMETERS FROM CARD READER USING THE READING | INPU0813 |
| 14 | C | PROCESS DEFINED THROUGH SUBROUTINE NXCARD. | INPU0814 |
| 15 | C | | INPU0815 |
| 16 | C*****METHOD. | | INPU0816 |
| 17 | C | THIS SUBROUTINE READS INPUT CARDS IN ANY ORDER EXCEPT FOR THE | INPU0817 |
| 18 | C | IT'S OR LAST CARD, EACH CARD IS FIRST LOGGED AT IT USING | INPU0818 |
| 19 | C | SUBROUTINE NXCARD. COLUMN 1 OF EACH CARD CONTAINS THE CODE | INPU0819 |
| 20 | C | LETTER SIGNIFYING WHAT VARIABLES ARE CONTAINED ON THE CARD, THE | INPU0820 |
| 21 | C | CARD CODE IS CHECKED AND THE CARD IS READ INTO THE PROGRAM BY | INPU0821 |
| 22 | C | THE CORRECT FORMAT IS DETERMINED FROM THE CARD CODE. IT IS NOT | INPU0822 |

| | | | |
|----|---|--|----------|
| 23 | C | NECESSARY TO DEFINE ALL INPUT PARAMETERS REQUIRED TO GENERATE | INPU0023 |
| 24 | C | PROGRAM DATA, EACH INPUT VARIABLE IS DEFINED IN THE BLOCK DATA | INPU0024 |
| 25 | C | SUBPROGRAM FOR NOMINAL VALUES CHANGES TO ANY ONE OR MORE | INPU0025 |
| 26 | C | NOMINAL VALUE DEFINED ON ONE CARD REQUIRED THAT ALL VARIABLES | INPU0026 |
| 27 | C | SPECIFIED FOR THAT CARD MUST BE INCLUDED, OMISSION OF ANY | INPU0027 |
| 28 | C | VARIABLE FROM A CARD WILL BE INTERPRETED TO HAVE A VALUE OF | INPU0028 |
| 29 | C | ZERO AND WILL OVERRIDE THE NOMINAL VALUE STORED THROUGH THE | INPU0029 |
| 30 | C | BLOCK DATA SUBPROGRAM, | INPU0030 |
| 31 | C | | INPU0031 |
| 32 | C | *****INPUTS | INPU0032 |
| 33 | C | VARIABLES ARE CARD INPUTS WITH THE FOLLOWING SPECIFIC CARD AND | INPU0033 |
| 34 | C | COLUMN LOCATIONS, ALL VARIABLES SPECIFIED AS INTEGERS MUST BE | INPU0034 |
| 35 | C | RIGHT JUSTIFIED, THOSE VARIABLES NOT SPECIFIED AS INTEGERS, | INPU0035 |
| 36 | C | HOLLERITH, OR ALPHANUMERIC ARE FLOATING POINT AND MUST BE READ | INPU0036 |
| 37 | C | IN THE UNITS NOTED? | INPU0037 |
| 38 | C | | INPU0038 |
| 39 | C | A CARD - START/STOP DATE | INPU0039 |
| 40 | C | 01 * A (HOLLERITH) | INPU0040 |
| 41 | C | 03-04 * STARTING MONTH (INTEGER) | INPU0041 |
| 42 | C | 05-07 * STARTING DAY (INTEGER) | INPU0042 |
| 43 | C | 09-12 * STARTING YEAR (INTEGER) | INPU0043 |
| 44 | C | 13-15 * FINAL MONTH (INTEGER) | INPU0044 |
| 45 | C | 17-18 * FINAL DAY (INTEGER) | INPU0045 |
| 46 | C | 20-23 * FINAL YEAR (INTEGER) | INPU0046 |
| 47 | C | | INPU0047 |
| 48 | C | B CARD - START/STOP DATE FOR OUTPUT | INPU0048 |
| 49 | C | 01 * B (HOLLERITH) | INPU0049 |
| 50 | C | 03-04 * STARTING MONTH (INTEGER) | INPU0050 |
| 51 | C | 05-07 * STARTING DAY (INTEGER) | INPU0051 |
| 52 | C | 09-12 * STARTING YEAR (INTEGER) | INPU0052 |
| 53 | C | 13-15 * FINAL MONTH (INTEGER) | INPU0053 |
| 54 | C | 17-18 * FINAL DAY (INTEGER) | INPU0054 |
| 55 | C | 20-23 * FINAL YEAR (INTEGER) | INPU0055 |
| 56 | C | | INPU0056 |
| 57 | C | C CARD - PROGRAM OPTIONS | INPU0057 |
| 58 | C | 01 * C (HOLLERITH) | INPU0058 |
| 59 | C | 04 PROGRAM CALCULATION | INPU0059 |
| 60 | C | * 0 DO CALCULATIONS FOR DATES SHOWN | INPU0060 |
| 61 | C | * 1 SKIP CALCULATIONS-ONLY PRINT FILES 01, 07, 09 | INPU0061 |
| 62 | C | 08 PRINT FILE 01 | INPU0062 |
| 63 | C | * 0 PRINT FILE 07 | INPU0063 |
| 64 | C | * 1 DO NOT PRINT FILE 07 | INPU0064 |
| 65 | C | 08 PRINT FILE 09 | INPU0065 |
| 66 | C | * 0 PRINT FILE 09 | INPU0066 |
| 67 | C | * 1 DO NOT PRINT FILE 09 | INPU0067 |
| 68 | C | 10 SUN AND MOON CALCULATIONS | INPU0068 |
| 69 | C | * 0 USE FILE 11 FOR WINDOW TIMES FOR SUN AND MOON | INPU0069 |
| 70 | C | * 1 CREATE FILE 11 ON SUN AND MOON TIMES | INPU0070 |
| 71 | C | * 2 DO NOT USE FILE 11 | INPU0071 |
| 72 | C | 12 CALCOMP PLOTTER OPTION | INPU0072 |
| 73 | C | * 0 GENERATE CALCOMP PLOT DATA ON FILE 01 FOR A | INPU0073 |
| 74 | C | CALENDAR YEAR | INPU0074 |
| 75 | C | * 1 GENERATE CALCOMP PLOT DATA ON FILE 01 FOR A | INPU0075 |
| 76 | C | CALENDAR MONTH | INPU0076 |
| 77 | C | * 2 DO NOT GENERATE CALCOMP OUTPUT | INPU0077 |
| 78 | C | | INPU0078 |
| 79 | C | D CARD - LOCATION OF RELEASE POINT | INPU0079 |
| 80 | C | 01 * D (HOLLERITH) | INPU0080 |
| 81 | C | 03-15 * GEODESIC LATITUDE OF RELEASE POINT (DEG) | INPU0081 |
| 82 | C | 16-25 * LONGITUDE OF RELEASE POINT (DEG) | INPU0082 |
| 83 | C | 26-35 * ALTITUDE ABOVE THE EARTH'S SURFACE (FEET) | INPU0083 |
| 84 | C | | INPU0084 |
| 85 | C | E CARD - BRIGHTNESS AND ELEVATION CONSTRAINTS | INPU0085 |
| 86 | C | 01 * E (HOLLERITH) | INPU0086 |
| 87 | C | 03-10 * MINIMUM ELEVATION OF RELEASE POINT (DEG) | INPU0087 |
| 88 | C | 11-15 * DEPRESSION ANGLE OF THE SUN (DEG) | INPU0088 |
| 89 | C | 16-20 * DEPRESSION ANGLE OF THE MOON (DEG) | INPU0089 |
| 90 | C | 21-25 * TOTAL SKY BACKGROUND BRIGHTNESS (RAYLEIGHS) | INPU0090 |
| 91 | C | 26-30 * DRIFT RATE OF CLOUD (KM/SEC) | INPU0091 |
| 92 | C | 31-35 * TOTAL TRACKING TIME (HRS) | INPU0092 |
| 93 | C | 36-40 * 1/2 CLOUDS GROWTH RATE (KM/SEC) | INPU0093 |
| 94 | C | | INPU0094 |
| 95 | C | F CARD - STATIONS TO BE COMBINED | INPU0095 |
| 96 | C | 01 * F (HOLLERITH) | INPU0096 |


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97      C          03-04 = THE NUMBER OF STATIONS TO COMBINE          INPU0097
98      C          06-07 = THE NUMBER OF THE FIRST STATION          INPU0098
99      C          INPU0099
100     C          G CARD = TRACKING SITE POSITIONAL DATA          INPU0100
101     C          01 = G (HOLLERITH)          INPU0101
102     C          03-04 = THE CODE NUMBER OF THIS STATION (INTEGER)          INPU0102
103     C          05-06 = CODE FOR FIXED OR AIRCRAFT TRACKING STATION (INT.)          INPU0103
104     C          00, STATION IS FIXED          INPU0104
105     C          01, STATION IS AIRCRAFT          INPU0105
106     C          08-25 = THE NAME OF THE TRACKING SITE (ALPHANUMERIC)          INPU0106
107     C          26-35 = GEODETIC LATITUDE (DEG)          INPU0107
108     C          36-45 = LONGITUDE (DEG)          INPU0108
109     C          46-55 = ALTITUDE (FEET)          INPU0109
110     C          INPU0110
111     C          H CARD = POSITIONS OF AIRCRAFT DURING EXPERIMENTAL PERIOD          INPU0111
112     C          01 = H (HOLLERITH)          INPU0112
113     C          03-04 = THE NUMBER THE AIRCRAFT STATION (INTEGER)          INPU0113
114     C          05-06 = INDEX NUMBER FOR AIRCRAFT POSITION DURING          INPU0114
115     C          THE EXPERIMENTAL PERIOD, THE AIRCRAFT POSITION          INPU0115
116     C          MUST BE IN HALF HOUR INCREMENTS WITH THE FIRST          INPU0116
117     C          INDEX #2 FOR THE POSITION AT .5 HRS. AFTER          INPU0117
118     C          RELEASE (INTEGER)          INPU0118
119     C          08-25 = THE NAME OF THE TRACKING SITE (ALPHANUMERIC)          INPU0119
120     C          26-35 = GEODETIC LATITUDE (DEG)          INPU0120
121     C          36-45 = LONGITUDE (DEG)          INPU0121
122     C          46-55 = ALTITUDE (FT)          INPU0122
123     C          INPU0123
124     C          I CARD = FINAL CARD TO SPECIFY END OF CASE          INPU0124
125     C          01 = I (HOLLERITH)          INPU0125
126     C          02-05 = CASE NUMBER (INTEGER)          INPU0126
127     C          06-07 = CODE FOR FINAL INPUT CASE          INPU0127
128     C          00, MORE CASES TO FOLLOW          INPU0128
129     C          01, THIS IS THE FINAL CASE          INPU0129
130     C          INPU0130
131     C *****OUTPUT*****          INPU0131
132     C          NONE          INPU0132
133     C          INPU0133
134     C *****RESTRICTIONS*****          INPU0134
135     C          A BLANK CARD OR DUMMY TITLE MUST PRECEDE ANY INPUT DATA FOR          INPU0135
136     C          EACH CASE, THE III CARD MUST ALWAYS BE THE LAST CARD OF EACH CASE          INPU0136
137     C          A PROGRAM EXECUTE USING ALL NOMINAL VALUES MUST HAVE AT LEAST          INPU0137
138     C          THE BLANK CARD AND THE II CARD FOR INPUT,          INPU0138
139     C          INPU0139
140     C *****SUBPROGRAMS REQUIRED*****          INPU0140
141     C          NXCARD          INPU0141
142     C          INPU0142
143     C *****END OF DOCUMENTATION CARDS*****          INPU0143
144     C          INPU0144
145     C          SUBROUTINE INPUT          INPU0145
146     C          COMMON/BLKX /KMONTH, KDAY, KYEAR, LMONTH, LDAY, LYEAR, KMO, KDA,          INPU0146
147     C          1 KTR, LMOY, LDA, LYR, TCALC, IPRY, IRTY, IPRY21, IPLY          INPU0147
148     C          COMMON/BLKE /PHIPDG, LAMPDG, HEIGHT          INPU0148
149     C          COMMON/BLKE /RESTR(8)          INPU0149
150     C          COMMON/BLKD /NS, NOS(12)          INPU0150
151     C          COMMON/BLKE /NAME(3,12), PHT(12), LAMBDA(12), ALT(12), MOVE(12)          INPU0151
152     C          COMMON/BLKE /PNAME(3,7), PLAT(7), PLON(7), PALT(7), JAIR          INPU0152
153     C          COMMON/BLKT /ICASE, IFINAL          INPU0153
154     C          DIMENSION FORMAT(2), IMAGE(15)          INPU0154
155     C          REAL LAMPDG, LAMBDA          INPU0155
156     C          DATA LA, LB, LC, LD, LE, LF, LG, LH, LI, SMAY, INB, INC, END, SNE, SHF, SHB, SHH,          INPU0156
157     C          11M17          INPU0157
158     C READ INPUTS          INPU0158
159     C          DATA FORMAT(1) /12H(A1,23A6,A1)/          INPU0159
160     C          WRITE(6,100)          INPU0160
161     C LOOK AT FIRST CARD IMAGE AND PRINT IT          INPU0161
162     C          4 READ(5,FORMAT) IMAGE          INPU0162
163     C          WRITE(6,110) IMAGE          INPU0163
164     C LOOK AT CARD IMAGE AND PRINT IT          INPU0164
165     C          5 CALL NXCARD(FORMAT, IMAGE, 15)          INPU0165
166     C          WRITE(6,110) IMAGE          INPU0166
167     C READ INPUT CARD USING CORRECT CARD FORMAT AS DETERMINE BY CARD CODE,          INPU0167
168     C REPEAT LOGIC FROM STATEMENT 5 UNTIL II CARD IS READ,          INPU0168
169     C IF (IMAGE,NO,LA) GO TO 20          INPU0169

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| | | | |
|-----|--|----------|-----|
| 170 | IF (IMAGE,EO,LB) GO TO 20 | INPU0170 | 16 |
| 171 | IF (IMAGE,EO,LC) GO TO 30 | INPU0171 | 19 |
| 172 | IF (IMAGE,EO,LD) GO TO 40 | INPU0172 | 22 |
| 173 | IF (IMAGE,EO,LE) GO TO 50 | INPU0173 | 25 |
| 174 | IF (IMAGE,EO,LF) GO TO 60 | INPU0174 | 28 |
| 175 | IF (IMAGE,EO,LG) GO TO 70 | INPU0175 | 31 |
| 176 | IF (IMAGE,EO,LH) GO TO 80 | INPU0176 | 34 |
| 177 | IF (IMAGE,EO,LI) GO TO 90 | INPU0177 | 37 |
| 178 | WRITE (61120) | INPU0178 | 40 |
| 179 | GO TO 4 | INPU0179 | 42 |
| 180 | 10 READ (5,210) KMONTH,KDAY ,RYEAR ,LMONTH,LDAY ,LYEAR | INPU0180 | 43 |
| 181 | GO TO 5 | INPU0181 | 51 |
| 182 | 20 READ (5,210) KMO, KDAY KYR, LMO, LDA, LYR | INPU0182 | 52 |
| 183 | GO TO 5 | INPU0183 | 60 |
| 184 | 30 READ (5,230) ICALC, IRR7, IRR9, IRR10, IPLOT | INPU0184 | 61 |
| 185 | GO TO 5 | INPU0185 | 68 |
| 186 | 40 READ (5,240) PHIPDG,LAMPDG,HEIGHT | INPU0186 | 69 |
| 187 | GO TO 5 | INPU0187 | 72 |
| 188 | 50 READ (5,250) (RESTRI(I))I=2,8) | INPU0188 | 73 |
| 189 | GO TO 5 | INPU0189 | 78 |
| 190 | 60 READ(5,260) NS,(NOS(I))I=1,NS) | INPU0190 | 79 |
| 191 | GO TO 5 | INPU0191 | 85 |
| 192 | 70 READ(5,270) N,MOVE(N);(NAME(J,N))J=2,3),PHI(N),LAMBDA(N),ALT(N) | INPU0192 | 86 |
| 193 | GO TO 5 | INPU0193 | 94 |
| 194 | 80 READ(5,270) N,JAIR,(NAME(J,JAIR))J=1,3),PLAY(JAIR),PLON(JAIR), | INPU0194 | 95 |
| 195 | 1 PAUT(JAIR) | INPU0195 | |
| 196 | GO TO 5 | INPU0196 | 103 |
| 197 | 90 READ (5,290) ICASE,IFINAL | INPU0197 | 104 |
| 198 | RETURN | INPU0198 | 108 |
| 199 | 100 FORMAT(1H1) | INPU0199 | 109 |
| 200 | 110 FORMAT(1X X1,13A6,A3) | INPU0200 | 109 |
| 201 | 120 FORMAT(61H ***** THE FOLLOWING IS ILLEGAL AND WILL BE IGNORED ** | INPU0201 | 109 |
| 202 | 100000) | INPU0202 | |
| 203 | 210 FORMAT(2X 2(2(12,1X),14,1X)) | INPU0203 | 109 |
| 204 | 230 FORMAT (2X,5I2) | INPU0204 | 109 |
| 205 | 240 FORMAT(5X 3F(10,0) | INPU0205 | 109 |
| 206 | 250 FORMAT(5X,7F5,0) | INPU0206 | 109 |
| 207 | 260 FORMAT(2X X3(12,1X)) | INPU0207 | 109 |
| 208 | 270 FORMAT(2X,2I2,1X,3A6,3F10,0) | INPU0208 | 109 |
| 209 | 290 FORMAT(1X,14,12) | INPU0209 | 109 |
| 210 | END | INPU0210 | 109 |

23728 WORDS OF MEMORY USED BY THIS COMPILATION

67906 01 09-25-72 33,606 READ INPUT PARAMETERS

*****ROUTINE INPUT*****

REFAGE

PROGRAM BREAK 594
COMMON LENGTH 8
V COUNT BYTS 5

PRIMARY SYMDEF ENTRY

INPUT 8

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

| | | |
|---|------|-----|
| 1 | BLK1 | 21 |
| 2 | BLK2 | 3 |
| 3 | BLK3 | 10 |
| 4 | BLK4 | 15 |
| 5 | BLK5 | 124 |
| 6 | BLK6 | 98 |
| 7 | BLK7 | 8 |

SYNREF

10 :PBNV.
11 :PPLC.
12 :PRDD.
13 :PRTN.
14 :PSET.
15 :PSSD.
16 :PWRD.
17 :NBERD

554 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JHPA 050171/052571

JMRB 050171/052571

JHPC 050171/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

** 19568 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY

67906 01 09-25-72 11,608 PRINT INPUT PARAMETERS

*****SUBROUTINE INPRY*****

| | | | |
|----|---|---|----------|
| 1 | CINPR | PRINT INPUT PARAMETERS | INPR0001 |
| 2 | C*****SUBROUTINE INPRY***** | | INPR0002 |
| 3 | C | | INPR0003 |
| 4 | C*****START OF DOCUMENTATION CARDS***** | | INPR0004 |
| 5 | C | | INPR0005 |
| 6 | C*****NASA Wallops version of 02/01/70 | | INPR0006 |
| 7 | C | | INPR0007 |
| 8 | C*****LANGUAGE=FORTRAN IV | | INPR0008 |
| 9 | C | | INPR0009 |
| 10 | C*****MACHINE=GE 625 | | INPR0010 |
| 11 | C | | INPR0011 |
| 12 | C*****PURPOSE- | | INPR0012 |
| 13 | C | TO WRITE ALL PROGRAM INPUTS IN A FORMAT WHICH COMPLETELY | INPR0013 |
| 14 | C | DESCRIBES THE INPUT PARAMETERS TO BE USED IN THE PROGRAM | INPR0014 |
| 15 | C | EXECUTION. | INPR0015 |
| 16 | C | | INPR0016 |
| 17 | C*****METHOD- | | INPR0017 |
| 18 | C | ALL VARIABLES SPECIFIED IN SUBROUTINE INPUT ARE PRINTED IN A | INPR0018 |
| 19 | C | MANNER TO DESCRIBE FULLY TO THE PROGRAM USER THE INPUTS USED TO | INPR0019 |
| 20 | C | GENERATE PROGRAM OUTPUTS. THE FORMAT GENERATOR ROUTINE IS USED | INPR0020 |
| 21 | C | IN LIEU OF CUMBERSOME NORMAL FORMAT STATEMENTS FOR PRINT | INPR0021 |
| 22 | C | FORMATS. | INPR0022 |
| 23 | C | | INPR0023 |
| 24 | C*****INPUTS | | INPR0024 |
| 25 | C | | INPR0025 |
| 26 | C | KMONTH -MONTH NUMBER FOR STARTING CALCULATIONS | INPR0026 |
| 27 | C | | INPR0027 |
| 28 | C | KDAY -DAY NUMBER FOR STARTING CALCULATIONS | INPR0028 |
| 29 | C | | INPR0029 |
| 30 | C | KYEAR -YEAR NUMBER FOR STARTING CALCULATIONS | INPR0030 |
| 31 | C | | INPR0031 |
| 32 | C | LMONTH -MONTH NUMBER FOR STOPPING CALCULATIONS | INPR0032 |
| 33 | C | | INPR0033 |
| 34 | C | LDAY -DAY NUMBER FOR STOPPING CALCULATIONS | INPR0034 |
| 35 | C | | INPR0035 |
| 36 | C | LYEAR -YEAR NUMBER FOR STOPPING CALCULATIONS | INPR0036 |
| 37 | C | | INPR0037 |
| 38 | C | KMO -MONTH PLOTTING AND/OR PRINTING TO BEGIN | INPR0038 |
| 39 | C | | INPR0039 |
| 40 | C | KDA -DAY PLOTTING AND/OR PRINTING TO BEGIN | INPR0040 |
| 41 | C | | INPR0041 |
| 42 | C | KYE -YEAR PLOTTING AND/OR PRINTING TO BEGIN | INPR0042 |
| 43 | C | | INPR0043 |
| 44 | C | LMO -MONTH PLOTTING AND/OR PRINTING TO END | INPR0044 |
| 45 | C | | INPR0045 |
| 46 | C | LDA -DAY PLOTTING AND/OR PRINTING TO END | INPR0046 |
| 47 | C | | INPR0047 |
| 48 | C | LYE -YEAR PLOTTING AND/OR PRINTING TO END. | INPR0048 |
| 49 | C | | INPR0049 |
| 50 | C | ICALC -INTEGER CODE TO SIGNAL IF PROGRAM CALCULATIONS | INPR0050 |
| 51 | C | -ARE REQUESTED | INPR0051 |
| 52 | C | =0: PERFORM PROGRAM CALCULATIONS | INPR0052 |
| 53 | C | =1: DO NOT PERFORM PROGRAM CALCULATIONS | INPR0053 |
| 54 | C | | INPR0054 |
| 55 | C | IPRY -INTEGER CODE TO SIGNAL REQUEST PRINTING LINE 07 | INPR0055 |

| | | | | |
|-----|---|------------|---|----------|
| 86 | C | | =DATA | INPR0056 |
| 87 | C | | =0; PRINT FILE 07 DATA | INPR0057 |
| 88 | C | | =1; DO NOT PRINT FILE 07 DATA | INPR0058 |
| 89 | C | | | INPR0059 |
| 90 | C | IPRT9 | =INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09 | INPR0060 |
| 91 | C | | =DATA | INPR0061 |
| 92 | C | | =0; PRINT FILE 09 DATA | INPR0062 |
| 93 | C | | =1; DO NOT PRINT FILE 09 DATA | INPR0063 |
| 94 | C | | | INPR0064 |
| 95 | C | IPLOT | =INTEGER CODE TO SIGNAL REQUEST PLOTTING DATA | INPR0065 |
| 96 | C | | =0; CREATE A YRRE FOR PLOTTING DATA FOR 1 | INPR0066 |
| 97 | C | | = CALENDAR YEAR THROUGH FILE 01 AT 556 BP1 | INPR0067 |
| 98 | C | | =1; CREATE A YRRE FOR PLOTTING DATA FOR 1 | INPR0068 |
| 99 | C | | = CALENDAR MONTH THROUGH FILE 01 AT 556 BR1 | INPR0069 |
| 100 | C | | =2; DO NOT CREATE A PLOT YRRE | INPR0070 |
| 101 | C | | | INPR0071 |
| 102 | C | ICASE | =INTEGER VALUE OF CASE NUMBER | INPR0072 |
| 103 | C | | | INPR0073 |
| 104 | C | IFINAL | =INTEGER CODE NOTING LAST CASE | INPR0074 |
| 105 | C | | =0; MORE CASES TO FOLLOW | INPR0075 |
| 106 | C | | =1; THIS IS THE FINAL CASE | INPR0076 |
| 107 | C | | | INPR0077 |
| 108 | C | PH1PDG | =GEODEVIC LATITUDE OF RELEASE POINT (DEG) | INPR0078 |
| 109 | C | | | INPR0079 |
| 110 | C | LAMPDG | =LONGITUDE OF RELEASE POINT (DEG) | INPR0080 |
| 111 | C | | | INPR0081 |
| 112 | C | HEIGHT | =ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE | INPR0082 |
| 113 | C | | =(FT) | INPR0083 |
| 114 | C | | | INPR0084 |
| 115 | C | RESTR(2) | =MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION | INPR0085 |
| 116 | C | | =TO THE RELEASE POINT (DEG) | INPR0086 |
| 117 | C | | | INPR0087 |
| 118 | C | RESTR(3) | =MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH | INPR0088 |
| 119 | C | | =TRACKING STATION (DEG) | INPR0089 |
| 120 | C | | | INPR0090 |
| 121 | C | RESTR(4) | =MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH | INPR0091 |
| 122 | C | | =TRACKING STATION (DEG) | INPR0092 |
| 123 | C | | | INPR0093 |
| 124 | C | RESTR(5) | =MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE | INPR0094 |
| 125 | C | | =RELEASE POINT AS SEEN FROM EACH TRACKING STATION | INPR0095 |
| 126 | C | | =(RAYLEIGH) | INPR0096 |
| 127 | C | | | INPR0097 |
| 128 | C | RESTR(6) | =CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD | INPR0098 |
| 129 | C | | =AFTER RELEASE RELATIVE TO THE EARTH (KM/SEC) | INPR0099 |
| 130 | C | | | INPR0100 |
| 131 | C | RESTR(7) | =MINIMUM TRACKING PERIOD REQUIRED (HRS) | INPR0101 |
| 132 | C | | | INPR0102 |
| 133 | C | RESTR(8) | =ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE | INPR0103 |
| 134 | C | | =RELATIVE TO THE EARTH (KM/SEC) | INPR0104 |
| 135 | C | | | INPR0105 |
| 136 | C | NS | =THE NUMBER OF STATIONS USED IN THE PROGRAM | INPR0106 |
| 137 | C | | | INPR0107 |
| 138 | C | NOB(12) | =AN ARRAY CONTAINING THE STATION NUMBERS USED | INPR0108 |
| 139 | C | | | INPR0109 |
| 140 | C | NAME(3,12) | =NAME OF TRACKING STATIONS USED | INPR0110 |
| 141 | C | | | INPR0111 |
| 142 | C | PH2(12) | =GEODEVIC LATITUDE OF TRACKING STATION (DEG) | INPR0112 |
| 143 | C | | | INPR0113 |
| 144 | C | LAMBDA(12) | =LONGITUDE OF TRACKING STATION (DEG) | INPR0114 |
| 145 | C | | | INPR0115 |
| 146 | C | ALV(12) | =ALTITUDE OF TRACKING STATION ABOVE EARTH SURFACE | INPR0116 |
| 147 | C | | =(FT) | INPR0117 |
| 148 | C | | | INPR0118 |
| 149 | C | MODE(12) | =CODE NUMBER TO DETERMINE IF STATION COORDINATES | INPR0119 |
| 150 | C | | =ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT | INPR0120 |
| 151 | C | | =0; FOR FIXED STATION | INPR0121 |
| 152 | C | | =1; FOR AIRCRAFT | INPR0122 |
| 153 | C | | | INPR0123 |
| 154 | C | PNARB(3,7) | =ALPHANUMERIC DESCRIPTION FOR AIRCRAFT POSITION | INPR0124 |
| 155 | C | | =DURING EXPERIMENTAL PERIOD | INPR0125 |
| 156 | C | | | INPR0126 |
| 157 | C | PLAT(7) | =GEODEVIC LATITUDE OF AIRCRAFT DURING | INPR0127 |
| 158 | C | | =EXPERIMENTAL PERIOD (DEG) | INPR0128 |


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129 C INPR0129
130 C PLON(7) -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD INPR0130
131 C -(DEG) INPR0131
132 C INPR0132
133 C PALT(7) -ALTITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD INPR0133
134 C -(DEG) INPR0134
135 C INPR0135
136 C *****OUTPUT- INPR0136
137 C ON FILE 06-PRINTER INPR0137
138 C ALL VARIABLES LISTED ABOVE ARE USED FOR OUTPUT INPR0138
139 C INPR0139
140 C *****RESTRICTIONS- INPR0140
141 C FORMAT GENERATOR IS A GE-625 SYSTEMS ROUTINE, USE OF THIS INPR0141
142 C SUBROUTINE ON ANOTHER SYSTEM MAY REQUIRE THAT THESE FORMAT INPR0142
143 C GENERATORS BE CHANGED. INPR0143
144 C INPR0144
145 C *****SUBPROGRAMS REQUIRED- INPR0145
146 C NONE INPR0146
147 C INPR0147
148 C *****END OF DOCUMENTATION CARDS***** INPR0148
149 C INPR0149
150 SUBROUTINE INPR1 INPR0150
151 COMMON/BLKX /KMONTH,KDAY ,KYEAR ,LMONTH,LDAY ,LYEAR ,KMO, KDA, INPR0151
152 1 KYR, LMO, LDA, LYR, TCA, IPRV, IPRV9, IPRV12, IPLT INPR0152
153 COMMON/BLKX /PHIPDG, LAMPDG, HEIGHT INPR0153
154 COMMON/BLKX /RESTR(8) INPR0154
155 COMMON/BLKX /NS, NOS(12) INPR0155
156 COMMON/BLKX /NAME(3,12), PH(12), LAMBDA(12), ALT(12), MOVE(12) INPR0156
157 COMMON/BLKX /PNAME(12), PLAT(7), PLON(7), PALT(7), JAIR INPR0157
158 COMMON/BLKX / ICASE, IFINAL INPR0158
159 DIMENSION BPT(2) INPR0159
160 DATA OPT /8YES ,6HNO X INPR0160
161 C INPR0161
162 WRITE(6,1000) ICASE,KMONTH,KDAY,KYEAR,LMONTH,LDAY,LYEAR, INPR0162
163 B PHIPDG,LAMPDG,HEIGHT, INPR0163
164 C (RESTR(1:8)=2.8), INPR0164
165 D NS INPR0165
166 C WRITE OUT ONLY THOSE STATIONS BEING USED INPR0166
167 DO 100 I=1,NS INPR0167
168 K =NOS(I) INPR0168
169 WRITE(6,1001) K , (NAME(I,K),J=1,3),PH(I,K),LAMBDA(K),ALT(K) INPR0169
170 IF (MOVE(K),EQ,0) GO TO 100 INPR0170
171 C WRITE AIRCRAFT POSITIONS AT HALF HOUR INCREMENTS INTO THE TRACKING INPR0171
172 C PERIOD, INPR0172
173 DO 200 KK=2,7 INPR0173
174 C NO MORE AIRCRAFT POSITIONS TO BE WRITTEN INPR0174
175 IF (PALT(KK),EQ,0) GO TO 100 INPR0175
176 200 WRITE(6,1001) K,(PNAME(J,KK),J=1,3),PLAT(KK),PLON(KK),PALT(KK) INPR0176
177 100 CONTINUE INPR0177
178 IF (IPRV(1-1) 11.12+13 INPR0178
179 11 ICR11 =1 INPR0179
180 JCR11 =0 INPR0180
181 GO TO 14 INPR0181
182 12 ICR11 =0 INPR0182
183 JCR11 =1 INPR0183
184 GO TO 14 INPR0184
185 13 ICR11 =1 INPR0185
186 JCR11 =1 INPR0186
187 14 IRLY =IPLT INPR0187
188 IF (IRLY,NE,0) IPLT = IPLT - 1 INPR0188
189 WRITE (6,1002) OPT(1:SCALE+1),OPT(1:PRV7+1),OPT(1:PRV9+1),OPT(1:ICR11+1) INPR0189
190 1 ,OPT(1:JCR11 +1),OPT(1:IPLT +1),KMO,KDA,KYR,LMO,LDA,LYR INPR0190
191 C INPR0191
192 1000 FORMAT GENERATOR INPR0192
193 RESTORE INPR0193
194 ***** RELEASE WINDOW PROGRAM INPR0194
195 XAM INPUT ***** CASE II INPR0195
196 SPACE 1 INPR0196
197 EARD CODE INPR0197
198 A *****EPOCH CARD START DATE Y1/M1/D1 STOR DATE Y1/M1/D1 INPR0198
199 X/ 'I 'X INPR0199
200 SPACE 2 INPR0200
201 D *****RELEASE POINT INPR0201

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202          SPACE 1                                INPR0202
203          LATITUDE(DEG) = V F4      LONGITUDE(DEG) = F4      ALTITUDE INPR0203
204          XYUDE(EARTH RADII) = F4                                INPR0204
205          SPACE 2                                INPR0205
206          E      WINDOW RESTRICTIONS                                INPR0206
207          SPACE 1                                INPR0207
208          MIN. LOOK ELEVATION ANGLE(DEG) = F2      SUN ELEVATION INPR0208
209          XVIEW ANGLE(DEG) = F3                                INPR0209
210          SPACE 1                                INPR0210
211          MOON ELEVATION ANGLE(DEG) = F3      TOTAL SKY INPR0211
212          X BRIGHTNESS(RAYLEIGH/A) = F3                                INPR0212
213          SPACE 1                                INPR0213
214          DRIFT RATE (KM/SEC) = F3      MINIMUM TIME INPR0214
215          XBACKING TIME(HOURS) = F3                                INPR0215
216          SPACE 1                                INPR0216
217          GROWTH RATE (KM/SEC) = F3                                INPR0217
218          SPACE 2                                INPR0218
219          F      NUMBER OF STATIONS TO COMBINE = I1 INPR0219
220          SPACE 2                                INPR0220
221          G      STATIONS TO COMBINE                                INPR0221
222          SPACE 1                                INPR0222
223          NO, STATION NAME          LATITUDE(DEG)  LONGITUDE(DEG)  ALTITUDE INPR0223
224          XDISTANCE(I, J)                                INPR0224
225          END OF FORHAY                                INPR0225
226          1001 FORHAY(11X,12,2X,3A6,2X,2F13.4,F35,0//) INPR0226 90
227          1002 FORHAY GENERATOR                                INPR0227
228          RESTORE                                INPR0228
229          ***** PROGRAM OPTION INPR0229
230          XG *****                                INPR0230
231          SPACE 1                                INPR0231
232          ***** OPTIONS INPR0232
233          SPACE 1                                INPR0233
234          PREFORM PROGRAM CALCULATIONS = 'A' INPR0234
235          SPACE 1                                INPR0235
236          PRINT RELEASE WINDOW DAILY TIME INTERVALS PER CONSTRAINT INPR0236
237          XPER STATION = 'A' INPR0237
238          SPACE 1                                INPR0238
239          PRINT TOTAL DAILY RELEASE WINDOW TIME INTERVALS = 'A' INPR0239
240          SPACE 2                                INPR0240
241          CREATE TAPE OF SUN AND MOON DAILY TIME INTERVALS FOR EACH INPR0241
242          X STATION = 'A' INPR0242
243          SPACE 1                                INPR0243
244          USE EXISTING TAPE OF SUN AND MOON DAILY TIME INTERVALS FOR INPR0244
245          XE EACH STATION = 'A' INPR0245
246          SPACE 1                                INPR0246
247          CREATE A TAPE FOR PLOTTING TOTAL DAILY RELEASE WINDOWS INPR0247
248          X 'A' INPR0248
249          SPACE 2                                INPR0249
250          ***** DATES TO BE PLOTTED AND INPR0250
251          XDATE PRINTED ***** INPR0251
252          SPACE 1                                INPR0252
253          START DATE '1/1/ '11      STOP DATE INPR0253
254          XDATE '1/1/ '11 INPR0254
255          END OF FORHAY                                INPR0255
256          RETURN                                INPR0256 90
257          END                                INPR0257 91

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25984 WORDS OF MEMORY USED BY THIS COMPILE

67986 05 04-25-72 11.613 PRINT INPUT PARAMETERS

***** SUBROUTINE INPR0200 *****

PREFACE

PROGRAM BREAK 745
COMMON LENGTH 8
V COUNT DIVS 5

PRIMARY SYMBOL ENTRY

INPR02 8

SECONDARY SYMBOL ENTRY

| BLANK | LENGTH |
|---------|--------|
| 1 BLANK | 25 |
| 2 BLANK | 5 |
| 3 BLANK | 10 |
| 4 BLANK | 15 |
| 5 BLANK | 120 |
| 6 BLANK | 50 |
| 7 BLANK | 8 |

SUMMARY

10 ,PROMPT
11 ,PROMPT
12 ,PROMPT

745 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY OVER JHPA 090171/052521 JHRS 090171/052521 JHPC 090171/052521
THERE WERE NO WARNING BEARS IN THE ABOVE ASSEMBLY
60 19400 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY.

67900 08 09-25-72 111610 CONVERSION ROUTINE

*****CONVERSION ROUTINE CONVERSION*****

| | | | |
|----|------|--|----------|
| 1 | CONV | CONVERSION ROUTINE | CONV0001 |
| 2 | C | *****CONVERSION ROUTINE CONVERSION***** | CONV0002 |
| 3 | C | | CONV0003 |
| 4 | C | *****START OF DOCUMENTATION CARDSET***** | CONV0004 |
| 5 | C | | CONV0005 |
| 6 | C | *****NABA WALLPS VERSION OF 02X05470 | CONV0006 |
| 7 | C | | CONV0007 |
| 8 | C | *****LANGUAGE-FORTRAN IV | CONV0008 |
| 9 | C | | CONV0009 |
| 10 | C | *****MACHINE-ON 025 | CONV0010 |
| 11 | C | | CONV0011 |
| 12 | C | *****PURPOSE- | CONV0012 |
| 13 | C | TO CONVERT STATION AND CLOUD PARAMETERS TO NECESSARY REQUESTING | CONV0013 |
| 14 | C | VARIABLES USED IN THE ENTIRE PROGRAM | CONV0014 |
| 15 | C | | CONV0015 |
| 16 | C | *****METHOD- | CONV0016 |
| 17 | C | GIVEN THE GEOCENTRIC COORDINATES OF THE RELEASE POINT AND OF THE | CONV0017 |
| 18 | C | STATIONS, CONVERT TO GEOCENTRIC AND ALSO CALCULATE THE FOLLOWING | CONV0018 |
| 19 | C | | CONV0019 |
| 20 | C | A, THE RADII VECTORS FOR THE RELEASE POINT AND STATIONS IN ERU | CONV0020 |
| 21 | C | | CONV0021 |
| 22 | C | B, THE SINES AND COSINES OF THE GEOCENTRIC COORDINATES | CONV0022 |
| 23 | C | | CONV0023 |
| 24 | C | C, THE GEOCENTRIC XYZ COORDINATES IN ERU | CONV0024 |
| 25 | C | | CONV0025 |
| 26 | C | D, THE RESTRICTIONS IN DEGREES TO RADIAN | CONV0026 |
| 27 | C | | CONV0027 |
| 28 | C | E, THE SRAE FIXED DRIFT OF THE CLOUD IN DEGREES/HOUR | CONV0028 |
| 29 | C | | CONV0029 |
| 30 | C | F, THE NECESSARY DAYS REFERENCED TO AN EPOCH DATE OF JANUARY 0 | CONV0030 |
| 31 | C | OF THE YEAR REFERENCED TO BOTH CALCULATIONS, | CONV0031 |
| 32 | C | | CONV0032 |
| 33 | C | G, THE MEAN LONGITUDE OF THE SUN FOR THE FIRST DAY TO BE | CONV0033 |
| 34 | C | CALCULATED, | CONV0034 |
| 35 | C | | CONV0035 |
| 36 | C | H, ROUGH ESTIMATE OF THE SUN AND MOON TIME INTERVALS FOR THE | CONV0036 |
| 37 | C | FIRST DAY FOR EACH STATION, | CONV0037 |
| 38 | C | | CONV0038 |
| 39 | C | *****INPUTS | CONV0039 |
| 40 | C | | CONV0040 |
| 41 | C | LENGTH - MONTH NUMBER FOR STOPPING CALCULATIONS | CONV0041 |
| 42 | C | | CONV0042 |
| 43 | C | LEST - DAY NUMBER FOR STOPPING CALCULATIONS | CONV0043 |
| 44 | C | | CONV0044 |
| 45 | C | LYEAR - YEAR NUMBER FOR STOPPING CALCULATIONS | CONV0045 |

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|-----|---|--------------|---|----------|
| 46 | C | | | CONV0846 |
| 47 | C | MONTH | -MONTH NUMBER FOR STARTING CALCULATIONS | CONV0847 |
| 48 | C | | | CONV0848 |
| 49 | C | DAY | -DAY NUMBER FOR STARTING CALCULATIONS | CONV0849 |
| 50 | C | | | CONV0850 |
| 51 | C | YEAR | -YEAR NUMBER FOR STARTING CALCULATIONS | CONV0851 |
| 52 | C | | | CONV0852 |
| 53 | C | PHIP08 | -GEOGRAPHIC LATITUDE OF RELEASE POINT (DEG) | CONV0853 |
| 54 | C | | | CONV0854 |
| 55 | C | LAMP08 | -LONGITUDE OF RELEASE POINT (DEG) | CONV0855 |
| 56 | C | | | CONV0856 |
| 57 | C | ALTY08 | -ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE - (M) | CONV0857 |
| 58 | C | | | CONV0858 |
| 59 | C | | | CONV0859 |
| 60 | C | HEUTR(2) | -MAXIMUM ELEVATION LOOK ANGLE FROM EACH STATION - TO THE RELEASE POINT (DEG) | CONV0860 |
| 61 | C | | | CONV0861 |
| 62 | C | | | CONV0862 |
| 63 | C | HEUTR(3) | -MAXIMUM SON ELEVATION LOOK ANGLE FROM EACH - TRACKING STATION (DEG) | CONV0863 |
| 64 | C | | | CONV0864 |
| 65 | C | | | CONV0865 |
| 66 | C | HEUTR(4) | -MAXIMUM SON ELEVATION LOOK ANGLE FROM EACH - TRACKING STATION (DEG) | CONV0866 |
| 67 | C | | | CONV0867 |
| 68 | C | | | CONV0868 |
| 69 | C | HEUTR(5) | -MAXIMUM TOTAL SRY BACKGROUND BRIGHTNESS OF THE - RELEASE POINT AS SEEN FROM EACH TRACKING STATION - (RAYLEIGH) | CONV0869 |
| 70 | C | | | CONV0870 |
| 71 | C | | | CONV0871 |
| 72 | C | | | CONV0872 |
| 73 | C | HEUTR(6) | -CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD - AFTER RELEASE RELATIVE TO THE EARTH (KM/SEC) | CONV0873 |
| 74 | C | | | CONV0874 |
| 75 | C | | | CONV0875 |
| 76 | C | HEUTR(7) | -MINIMUM TRACKING PERIOD REQUIRED (HRS) | CONV0876 |
| 77 | C | | | CONV0877 |
| 78 | C | HEUTR(8) | -ONEHALF OF CLOUD GROWTH RATE AFTER RELEASE - RELATIVE TO THE EARTH (KM/SEC) | CONV0878 |
| 79 | C | | | CONV0879 |
| 80 | C | | | CONV0880 |
| 81 | C | NS | -THE NUMBER OF STATION USED IN THE PROGRAM | CONV0881 |
| 82 | C | | | CONV0882 |
| 83 | C | NS(12) | -AN ARRAY CONTAINING THE STATION NUMBERS USED | CONV0883 |
| 84 | C | | | CONV0884 |
| 85 | C | PHI(12) | -GEOGRAPHIC LATITUDE OF TRACKING STATION (DEG) | CONV0885 |
| 86 | C | | | CONV0886 |
| 87 | C | LAMB(12) | -LONGITUDE OF TRACKING STATION (DEG) | CONV0887 |
| 88 | C | | | CONV0888 |
| 89 | C | ALTY(12) | -ALTITUDE OF TRACKING STATION ABOVE EARTH SURFACE - (M) | CONV0889 |
| 90 | C | | | CONV0890 |
| 91 | C | | | CONV0891 |
| 92 | C | HEUT(12) | -CODE NUMBER TO DETERMINE IF STATION COORDINATES - ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT | CONV0892 |
| 93 | C | | | CONV0893 |
| 94 | C | | | CONV0894 |
| 95 | C | | | CONV0895 |
| 96 | C | | | CONV0896 |
| 97 | C | PHRE(13:7) | -ALPHANUMERIC DESCRIPTION FOR AIRCRAFT POSITION - DURING EXPERIMENTAL PERIOD | CONV0897 |
| 98 | C | | | CONV0898 |
| 99 | C | | | CONV0899 |
| 100 | C | PHET(7) | -GEOGRAPHIC LATITUDE OF AIRCRAFT DURING - EXPERIMENTAL PERIOD (DEG) | CONV0900 |
| 101 | C | | | CONV0901 |
| 102 | C | | | CONV0902 |
| 103 | C | PLER(7) | -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD | CONV0903 |
| 104 | C | | | CONV0904 |
| 105 | C | PLAT(7) | -ALTITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD - (DEG) | CONV0905 |
| 106 | C | | | CONV0906 |
| 107 | C | | | CONV0907 |
| 108 | C | DTM | -CONVERSION FACTOR FROM DEGREES TO RADIANS | CONV0908 |
| 109 | C | | | CONV0909 |
| 110 | C | RTU | -CONVERSION FACTOR FROM RADIANS TO HOURS | CONV0910 |
| 111 | C | | | CONV0911 |
| 112 | C | ERN | -CONVERSION FACTOR FROM EARTH RADII UNITS TO - KILOMETERS | CONV0912 |
| 113 | C | | | CONV0913 |
| 114 | C | | | CONV0914 |
| 115 | C | | | CONV0915 |
| 116 | C | DATE=DDMMYY- | | CONV0916 |
| 117 | C | | | CONV0917 |
| 118 | C | DATE | -JULIAN DATE FOR CURRENT DATA | CONV0918 |

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|-----|---|------------|---|----------|----------|
| 110 | C | | | | CONV0310 |
| 120 | C | NDFJ0 | -NUMBER OF DAYS FROM EPOCH DATE TO DATE FOR | CONV0320 | |
| 121 | C | | -STARTING ENCOUNTERS (INTEGER) | CONV0321 | |
| 122 | C | | | CONV0322 | |
| 123 | C | NDFY | -NUMBER OF DAYS FROM EPOCH DATE TO DATE FOR | CONV0323 | |
| 124 | C | | -STOPPING ENCOUNTERS (INTEGER) | CONV0324 | |
| 125 | C | | | CONV0325 | |
| 126 | C | SPJ00 | -JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS | CONV0326 | |
| 127 | C | | | CONV0327 | |
| 128 | C | SINCLV | -SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE | CONV0328 | |
| 129 | C | | | CONV0329 | |
| 130 | C | COSCLV | -COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE | CONV0330 | |
| 131 | C | | | CONV0331 | |
| 132 | C | SINCLN | -SINE OF RELEASE POINT'S LONGITUDE | CONV0332 | |
| 133 | C | | | CONV0333 | |
| 134 | C | COSCLN | -COSINE OF RELEASE POINT'S LONGITUDE | CONV0334 | |
| 135 | C | | | CONV0335 | |
| 136 | C | RVR | -RADIUS DISTANCE FROM EARTH CENTER TO RELEASE | CONV0336 | |
| 137 | C | | -POINT (ERU) | CONV0337 | |
| 138 | C | | | CONV0338 | |
| 139 | C | CRX | -GEOCENTRIC X COMPONENT OF RELEASE POINT (ERU) | CONV0339 | |
| 140 | C | | | CONV0340 | |
| 141 | C | CRY | -GEOCENTRIC Y COMPONENT OF RELEASE POINT (ERU) | CONV0341 | |
| 142 | C | | | CONV0342 | |
| 143 | C | CRZ | -GEOCENTRIC Z COMPONENT OF RELEASE POINT (ERU) | CONV0343 | |
| 144 | C | | | CONV0344 | |
| 145 | C | PRSP | -GEOCENTRIC LATITUDE OF RELEASE POINT (RADIAN) | CONV0345 | |
| 146 | C | | | CONV0346 | |
| 147 | C | RLR00 | -LONGITUDE OF RELEASE POINT (RADIAN) | CONV0347 | |
| 148 | C | | | CONV0348 | |
| 149 | C | R(2) | -ELEVATION CONSTRAINT (RADIAN) | CONV0349 | |
| 150 | C | | | CONV0350 | |
| 151 | C | R(3) | -SUN ELEVATION CONSTRAINT (RADIAN) | CONV0351 | |
| 152 | C | | | CONV0352 | |
| 153 | C | R(4) | -MOON ELEVATION CONSTRAINT (RADIAN) | CONV0353 | |
| 154 | C | | | CONV0354 | |
| 155 | C | R(5) | -INPUT VALUE FOR TOTAL SKY BACKGROUND BRIGHTNESS | CONV0355 | |
| 156 | C | | -(RAYLENGTH) | CONV0356 | |
| 157 | C | | | CONV0357 | |
| 158 | C | R(6) | -CLOUD DENSITY RATE (RADIAN/HR) | CONV0358 | |
| 159 | C | | | CONV0359 | |
| 160 | C | R(7) | -MONTHLY TRACKING PERIOD AFTER RELEASE (HOURS) | CONV0360 | |
| 161 | C | | | CONV0361 | |
| 162 | C | R(8) | -ONE-HALF OF CLOUD GROWTH RATE (RADIAN/HR) | CONV0362 | |
| 163 | C | | | CONV0363 | |
| 164 | C | SINSLV(12) | -SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE | CONV0364 | |
| 165 | C | | | CONV0365 | |
| 166 | C | COSSLV(12) | -COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE | CONV0366 | |
| 167 | C | | | CONV0367 | |
| 168 | C | SINSLN(12) | -SINE OF TRACKING STATION'S LONGITUDE | CONV0368 | |
| 169 | C | | | CONV0369 | |
| 170 | C | COSSLN(12) | -COSINE OF TRACKING STATION'S LONGITUDE | CONV0370 | |
| 171 | C | | | CONV0371 | |
| 172 | C | RVR(12) | -RADIUS VECTOR FROM EARTH CENTER TO TRACKING | CONV0372 | |
| 173 | C | | -STATION (ERU) | CONV0373 | |
| 174 | C | | | CONV0374 | |
| 175 | C | CRX(12) | -GEOCENTRIC X COMPONENT OF TRACKING STATION (ERU) | CONV0375 | |
| 176 | C | | | CONV0376 | |
| 177 | C | CRY(12) | -GEOCENTRIC Y COMPONENT OF TRACKING STATION (ERU) | CONV0377 | |
| 178 | C | | | CONV0378 | |
| 179 | C | CRZ(12) | -GEOCENTRIC Z COMPONENT OF TRACKING STATION (ERU) | CONV0379 | |
| 180 | C | | | CONV0380 | |
| 181 | C | PRSP(12) | -GEOCENTRIC LATITUDE OF TRACKING STATION (RADIAN) | CONV0381 | |
| 182 | C | | | CONV0382 | |
| 183 | C | RLR(12) | -LONGITUDE OF THE TRACKING STATION (RADIAN) | CONV0383 | |
| 184 | C | | | CONV0384 | |
| 185 | C | SINLAV(12) | -SINE OF AIRSHELL GEOCENTRIC LATITUDE DURING | CONV0385 | |
| 186 | C | | -EXPERIMENTAL PERIOD | CONV0386 | |
| 187 | C | | | CONV0387 | |
| 188 | C | COSLAV(12) | -COSINE OF AIRSHELL GEOCENTRIC LATITUDE DURING | CONV0388 | |
| 189 | C | | -EXPERIMENTAL PERIOD | CONV0389 | |
| 190 | C | | | CONV0390 | |
| 191 | C | SINLON(12) | -SINE OF AIRSHELL LONGITUDE DURING EXPERIMENTAL | CONV0391 | |

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|-----|---|--|--|----------|
| 192 | C | | -PERIOD | CONV0192 |
| 193 | C | | | CONV0193 |
| 194 | C | COS(LON1?) | -COSINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL | CONV0194 |
| 195 | C | | -PERIOD | CONV0195 |
| 196 | C | | | CONV0196 |
| 197 | C | RVS(1?) | -DISTANCE FROM EARTH CENTER TO AIRCRAFT DURING | CONV0197 |
| 198 | C | | -EXPERIMENTAL PERIOD (SRU) | CONV0198 |
| 199 | C | | | CONV0199 |
| 200 | C | AGBX(1?) | -GEOCENTRIC X COMPONENT OF AIRCRAFT POSITION | CONV0200 |
| 201 | C | | -DURING EXPERIMENTAL PERIOD (SRU) | CONV0201 |
| 202 | C | | | CONV0202 |
| 203 | C | AGBY(1?) | -GEOCENTRIC Y COMPONENT OF AIRCRAFT POSITION | CONV0203 |
| 204 | C | | -DURING EXPERIMENTAL PERIOD (SRU) | CONV0204 |
| 205 | C | | | CONV0205 |
| 206 | C | AGBZ(1?) | -GEOCENTRIC Z COMPONENT OF AIRCRAFT POSITION | CONV0206 |
| 207 | C | | -DURING EXPERIMENTAL PERIOD (SRU) | CONV0207 |
| 208 | C | | | CONV0208 |
| 209 | C | RLBY(1?) | -GEOCENTRIC LATITUDE OF AIRCRAFT DURING | CONV0209 |
| 210 | C | | -EXPERIMENTAL PERIOD (RADIANS) | CONV0210 |
| 211 | C | | | CONV0211 |
| 212 | C | RLBZ(1?) | -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD | CONV0212 |
| 213 | C | | -(RADIANS) | CONV0213 |
| 214 | C | | | CONV0214 |
| 215 | C | SUNL | -MEAN LONGITUDE OF THE SUN AT 0 HRS, UT, FOR 1ST | CONV0215 |
| 216 | C | | -DAY (DEG) | CONV0216 |
| 217 | C | | | CONV0217 |
| 218 | C | WINDOW(8,3,12) | -THE DAILY RELEASE WINDOW START/STOP TIMES, | CONV0218 |
| 219 | C | | -1ST INDEX FOR START/STOP TIMES, | CONV0219 |
| 220 | C | | -19375 FOR START TIMES | CONV0220 |
| 221 | C | | -24475 FOR STOP TIMES | CONV0221 |
| 222 | C | | -2ND INDEX FOR THE CONSTRAINT | CONV0222 |
| 223 | C | | - 1-EARTH SHADE | CONV0223 |
| 224 | C | | - 2-ELEVATION | CONV0224 |
| 225 | C | | - 3-SUN | CONV0225 |
| 226 | C | | - 4-MOON | CONV0226 |
| 227 | C | | - 5-TOTAL SKY BACKGROUND BRIGHTNESS | CONV0227 |
| 228 | C | | -3RD INDEX FOR THE STATION NUMBER | CONV0228 |
| 229 | C | | | CONV0229 |
| 230 | C | JEND | -NUMBER OF DISCRETE VALUES STORED FOR | CONV0230 |
| 231 | C | | -EXPERIMENTAL PERIOD DATA | CONV0231 |
| 232 | C | | | CONV0232 |
| 233 | C | | | CONV0233 |
| 234 | C | *****CONSTRAINTS- | | CONV0234 |
| 235 | C | | THE ESTIMATED TIME PERIODS CALCULATED FOR THE SUN AND MOON ARE | CONV0235 |
| 236 | C | | FOR APPROXIMATE TIMES FOR THE OCCURRENCE OF ASTRONOMICAL | CONV0236 |
| 237 | C | | twilight AND FOR THE MOON TO BE AT THE TRACKING STATION'S LOCAL | CONV0237 |
| 238 | C | | HORIZONTAL OTHER RELATIVE ELEVATION ANGLE OF THESE TWO | CONV0238 |
| 239 | C | | HEAVENLY BODIES TO EACH TRACKING STATION WHICH IS QUITE | CONV0239 |
| 240 | C | | DIFFERENT WILL REQUIRE A PROBLEM CHANGE, THE COEFFICIENTS 19.0 | CONV0240 |
| 241 | C | | AND 9.0 ARE THE APPROXIMATE VALUES FOR ASTRONOMICAL TWILIGHT AND | CONV0241 |
| 242 | C | | THE COEFFICIENTS 12.5 AND 9.0 ARE THE APPROXIMATE COEFFICIENTS | CONV0242 |
| 243 | C | | FOR MOONSET AND MOONRISE/TWILIGHT ARE FOR A POINT OF 0 DEGREES | CONV0243 |
| 244 | C | | LATITUDE AND 0 DEGREES LONGITUDE | CONV0244 |
| 245 | C | | THE GEODETIC EARTH MODEL USED IS THE FISHER EARTH MODEL WITH | CONV0245 |
| 246 | C | | AN AVERAGE EARTH RADIUS OF 6378.524 KILOMETERS; | CONV0246 |
| 247 | C | | | CONV0247 |
| 248 | C | *****SUBPROGRAMS REQUIRED- | | CONV0248 |
| 249 | C | SVDCS | | CONV0249 |
| 250 | C | | | CONV0250 |
| 251 | C | *****CONTENT OF DOCUMENTATION CARDS***** | | CONV0251 |
| 252 | C | | | CONV0252 |
| 253 | C | SUBROUTINE CONVER | | CONV0253 |
| 254 | C | COMMON/BLK1 /KMONTH,KDAY ,KYEAR ,LMONTH,LDAY ,LYEAR ,KNOZ NDA, | | CONV0254 |
| 255 | C | 1 KYN, LMOY BDA, LYR, SCALC, IPRTY, IPRTY9, IPRTS1,IPLOV | | CONV0255 |
| 256 | C | COMMON/BLK11 /DJUL, NMOY6, NMOY9, SPBCH | | CONV0256 |
| 257 | C | COMMON/BLK1 /PHIPDS,LANHDS,NETOY | | CONV0257 |
| 258 | C | COMMON/BLK11 /SINGLY, COSCLY, SINGUN, COSCLN, RVC | | CONV0258 |
| 259 | C | COMMON/BLK21 /CCK, COSY, COSZ | | CONV0259 |
| 260 | C | COMMON/BLK31 /PHI,RLANDA | | CONV0260 |
| 261 | C | COMMON/BLK1 /RBYTH(5) | | CONV0261 |
| 262 | C | COMMON/BLK11 /R(5) | | CONV0262 |
| 263 | C | COMMON/BLK1 /PNS, NDB(15) | | CONV0263 |
| 264 | C | COMMON/BLK1 /PNAME(36121) PNT(121) LANHDA(121) ALT(121) MOY(121) | | CONV0264 |

| | | |
|-----|--|----------|
| 265 | COMMON/BLK21/ SINCL(12); COSCL(12); SINCLN(12); COSCLN(12); | CONV0265 |
| 266 | 1 RVB(12) | CONV0266 |
| 267 | COMMON/BLK22/ SECX(12); SECY(12); SECZ(12) | CONV0267 |
| 268 | COMMON/BLK23/ RPHI(12); RLAND(12) | CONV0268 |
| 269 | COMMON/BLK24/ PWAHT(12); PLAT(12); PLON(12); PALT(12); JAIR | CONV0269 |
| 270 | COMMON/BLK25/ SINCLAT(12); COSCLAT(12); SINCLON(12); COSCLON(12); RPA(12) | CONV0270 |
| 271 | COMMON/BLK26/ AGCX(12); AGCY(12); AGCZ(12) | CONV0271 |
| 272 | COMMON/BLK27/ RCLAT(12); RCLON(12) | CONV0272 |
| 273 | COMMON/BLK28/ 2DTH, RVD, RYD, WALP, RYH, AU, DELTA(4), BHH, BSHA | CONV0273 |
| 274 | COMMON/BLK29/ SUNL, GHA | CONV0274 |
| 275 | COMMON/BLK30/ WINDOW(12,12) | CONV0275 |
| 276 | COMMON/BLK31/ JHR(12); WEX(12); WZ(12); BAS(12,7); C(12,7); JEED | CONV0276 |
| 277 | DOUBLE PRECISION DYN, RVD, RYD, WALP | CONV0277 |
| 278 | REAL GAMMA, LAMPD | CONV0278 |
| 279 | C | CONV0279 |
| 280 | ARGSTN(1) ATAN(X/BNYTS,0-0.01) | CONV0280 |
| 281 | SINLON(12) = AMOD(1,360) - 3 + YJEVTC + 279.87868, 360.) | CONV0281 |
| 282 | C FIND THE JULIAN DATE AT 0000S UT, FOR START DATE | CONV0282 |
| 283 | DAY = DAY | CONV0283 |
| 284 | YEAR = YEAR | CONV0284 |
| 285 | DMUL = DAYNUM(MONTH, DAY, YEAR) | CONV0285 |
| 286 | C LET JANUARY 8 OF YEAR BE THE EPOCH DATE FOR THE PROGRAM | CONV0286 |
| 287 | C FIND THE NUMBER OF DAYS PASS THE EPOCH FOR START DATE | CONV0287 |
| 288 | EPOCH = DAYNUM(1, 0, 0, YEAR) | CONV0288 |
| 289 | NDFJ8 = DMUL - EPOCH | CONV0289 |
| 290 | C FIND THE MEAN LONGITUDE OF THE SUN FOR START DATE | CONV0290 |
| 291 | YLS = (EPOCH - 2415019.5) / 36525.0 | CONV0291 |
| 292 | SUNL = SUNLON(YJC) | CONV0292 |
| 293 | SUNL = AMOD(SUNL + 0.98564736 + (NDFJ8 - 0.5) * .3607) | CONV0293 |
| 294 | C FIND THE NUMBER OF DAYS PASS THE EPOCH FOR STOP DATE | CONV0294 |
| 295 | DAY = DAY | CONV0295 |
| 296 | YEAR = YEAR | CONV0296 |
| 297 | DMUL = DAYNUM(MONTH, DAY, YEAR) - EPOCH | CONV0297 |
| 298 | C CONVERT SUN, MOON AND ELEVATION RESTRICTIONS TO RADIAN | CONV0298 |
| 299 | R(1) = RESTR(1) * DYN | CONV0299 |
| 300 | R(2) = RESTR(2) * DYN | CONV0300 |
| 301 | R(3) = RESTR(3) * DYN | CONV0301 |
| 302 | R(4) = RESTR(4) * DYN | CONV0302 |
| 303 | R(5) = RESTR(5) | CONV0303 |
| 304 | R(6) = RESTR(6) | CONV0304 |
| 305 | C CONVERT SMOOD ANGLES TO RADIAN AND TRANSFORM TO GEOCENTRIC | CONV0305 |
| 306 | PHIP = PHIRDS * DYN | CONV0306 |
| 307 | RLAND = LANEDS * DYN | CONV0307 |
| 308 | CALL MDYGE (HEIGHT, DUNNY, PHIP, RPHI) | CONV0308 |
| 309 | C COMPUTE TRIG FUNCTIONS OF RELEASE AT GEOCENTRIC ANGLES | CONV0309 |
| 310 | SINCL = SIN(PHIP) | CONV0310 |
| 311 | COSCL = COS(PHIP) | CONV0311 |
| 312 | SINCLN = SIN(RLAND) | CONV0312 |
| 313 | COSCLN = COS(RLAND) | CONV0313 |
| 314 | C CALCULATE RELEASE POINT RADIUS VECTOR AND GEOG. X, Y, Z COMP. IN BRD | CONV0314 |
| 315 | RVB = 1.0 * HEIGHT | CONV0315 |
| 316 | COGX = RVB * COSCL * COSCLN | CONV0316 |
| 317 | COGY = RVB * COSCL * SINCLN | CONV0317 |
| 318 | COGZ = RVB * SINCL | CONV0318 |
| 319 | C CONVERT SMOOD DRIFT RATE AND GROWTH RATE TO RADIAN PER HOUR | CONV0319 |
| 320 | R(1) = (23600. / EPH) * (RESTR(6) * RVB) | CONV0320 |
| 321 | R(2) = (23600. / EPH) * (RESTR(7) * RVB) | CONV0321 |
| 322 | C | CONV0322 |
| 323 | DO 100 I=1, N | CONV0323 |
| 324 | L = NDB(1) | CONV0324 |
| 325 | C PERFORM DO LOOP ON ONLY STATIONS REQUESTED THRU INPUT | CONV0325 |
| 326 | C CONVERT STATION ALT TO BRU AND ANGLES TO RAD AND TRANSFORM TO GEOCENTRIC | CONV0326 |
| 327 | HGT = ALT(1) * .3048 - 0.5 / BRH | CONV0327 |
| 328 | RPHI(1) = PHIP(1) * DYN | CONV0328 |
| 329 | RLAND(1) = LANED(1) * DYN | CONV0329 |
| 330 | CALL MDYGE (HGT, RVB(1), RPHI(1), RPHI(1)) | CONV0330 |
| 331 | C COMPUTE TRIG FUNCTIONS OF STATION'S GEOCENTRIC ANGLES | CONV0331 |
| 332 | SINCL(1) = SIN(RPHI(1)) | CONV0332 |
| 333 | COSCL(1) = COS(RPHI(1)) | CONV0333 |
| 334 | SINCLN(1) = SIN(RLAND(1)) | CONV0334 |
| 335 | COSCLN(1) = COS(RLAND(1)) | CONV0335 |
| 336 | C COMPUTE STATION'S GEOCENTRIC X, Y, Z COMPONENTS IN BRU | CONV0336 |
| 337 | COGX(1) = RVB(1) * COSCL(1) * COSCLN(1) | CONV0337 |

~~(S) DUNN DOES NOT APPEAR IN ROAD, DATA, CANNON OR LEFT OF BUREAU (W)~~

24694 WORDS OF MEMORY USED BY THIS COMPLETION

67906 03 09-25-72 15:620 CONVERSION ROUTINE

*****ROUTINE CONVERSATION*****

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| COMMON LENGTH | |
|---------------|---|
| 1 | 1 |
| 2 | 1 |
| 3 | 1 |
| 4 | 1 |
| 5 | 1 |
| 6 | 1 |
| 7 | 1 |
| 8 | 1 |
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| 10 | 1 |
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| 95 | 1 |
| 96 | 1 |
| 97 | 1 |
| 98 | 1 |
| 99 | 1 |
| 100 | 1 |

SALE ANNUAL

~~PRISONER SYNDICATE RUMOR~~

CONVER 8
SECONDARY SYMBOL ENTRY

| BLOCK | LENGTH |
|----------|--------|
| 1 BLK1 | 22 |
| 2 BLK2 | 0 |
| 3 BLK3 | 0 |
| 4 BLK4 | 0 |
| 5 BLK5 | 0 |
| 6 BLK6 | 0 |
| 7 BLK7 | 10 |
| 10 BLK10 | 10 |
| 11 BLK11 | 10 |
| 12 BLK12 | 100 |
| 13 BLK13 | 70 |
| 14 BLK14 | 40 |
| 15 BLK15 | 00 |
| 16 BLK16 | 50 |
| 17 BLK17 | 40 |
| 20 BLK20 | 20 |
| 21 BLK21 | 10 |
| 22 BLK22 | 20 |
| 23 BLK23 | 0 |
| 24 BLK24 | 000 |
| 25 BLK25 | 010 |

SYNREF

26 CON
27 SIN
30 AYEN
31 SORV
32 DAYHUN
33 GDTGOC

1312 IS THE NEXT AVAILABLE LOCATION.
GMAP VERSION/ASSEMBLY DATES JPA 090172/052571 JMRB 090171/052571 JHPC 090171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
09 1978V WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

07006 01 0V-05-72 11.630

*****SUBROUTINE GDTGOC*****

| | | |
|----|--|----------|
| 1 | CDGOC | GDGC0001 |
| 2 | *****SUBROUTINE GDTGOC***** | GDGC0002 |
| 3 | C | GDGC0003 |
| 4 | *****START OF DOCUMENTATION CARDS***** | GDGC0004 |
| 5 | C | GDGC0005 |
| 6 | *****HALLIPS VERSION OF GDTGOC | GDGC0006 |
| 7 | C | GDGC0007 |
| 8 | *****LANGUAGE-FORTHAN IV | GDGC0008 |
| 9 | C | GDGC0009 |
| 10 | *****MACHINE-GE 025 | GDGC0010 |
| 11 | C | GDGC0011 |
| 12 | *****PURPOSE. | GDGC0012 |
| 13 | C | GDGC0013 |
| 14 | C | GDGC0014 |
| 15 | *****METHOD OF ATTACK. | GDGC0015 |
| 16 | C | GDGC0016 |
| 17 | C | GDGC0017 |
| 18 | C | GDGC0018 |
| 19 | C | GDGC0019 |
| 20 | C | GDGC0020 |
| 21 | C | GDGC0021 |
| 22 | *****REQUIRED INPUT. | GDGC0022 |
| 23 | C | GDGC0023 |
| 24 | C | GDGC0024 |
| 25 | C | GDGC0025 |
| 26 | C | GDGC0026 |
| 27 | C | GDGC0027 |

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28 C*****OUTPUT GENERATED***** G00C0028
29 C G00C0029
30 C R -RADIUS VECTOR FROM GANTH CENTER (G00) G00C0030
31 C G00C0031
32 C BLAY -SECONDARY LATITUDE (RADIANS) G00C0032
33 C G00C0033
34 C*****RESTRICTIONS***** G00C0034
35 C NONE KNOWN G00C0035
36 C G00C0036
37 C*****SUBPROGRAMS REQUIRED***** G00C0037
38 C NONE G00C0038
39 C G00C0039
40 C*****END OF DOCUMENTATION CARDS***** G00C0040
41 C G00C0041
42 SUBROUTINE GDT02C (ELTYR,CDLAY,HEXT) G00C0042
43 DATA 371.00121817, 0.000000000000 G00C0043
44 ANGSTROMS, AYANG(X) SERV(1.00-X) G00C0044
45 C DEFINE THE FUNCTIONS OF LAY G00C0045
46 SPMH = SIN(CDLAY) G00C0046
47 CPMH = COS(CDLAY) G00C0047
48 THPM = SPMH/CPMH G00C0048
49 C FIND X AND Y OF BONE 11 AND 12 (SEE NOTE ON BONE LAY) G00C0049
50 X = 0.47 *SURT(1) + 0.000000000000 G00C0050
51 Y = 0.000000000000 G00C0051
52 C FIND S AND T COMPONENTS (SEE BONE 11 AND 12 OF BONE LAY) G00C0052
53 RS = 0.000000000000 G00C0053
54 RV = 0.000000000000 G00C0054
55 C FIND R,DLAY G00C0055
56 R = 0.000000000000 G00C0056
57 DLAY = ARCTAN(RV/RS) G00C0057
58 RETURN G00C0058
59 END G00C0059

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28862 WORDS OF MEMORY USED BY THIS COMPILEATION

67006 02 00-25-72 33,642

*****ROUTINE GDT02C*****

PREFACE

PROGRAM BREAK 130
COMMON LENGTH 0
V BOUNT DIVE 5

PRIMARY SYMBOL ENTRY

GDT02C 0

SECONDARY SYMBOL ENTRY

BLOCK LENGTH

SYMBOL

1 C00
2 S10
3 SERV
4 AYANG

130 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/RESEMBLY DATE JMR 050171/052521 JMR 050171/052521 JMR 050171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
66 19289 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY.

67006 02 00-25-72 33,649 ELEVATION CONSTRAINT

*****ROUTINE ELG02C*****

1 C000 ELEVATION CONSTRAINT ELG02C01
2 C*****ROUTINE ELG02C***** ELG02C02
3 C ELG02C03

| | | | |
|----|---|--|----------|
| 4 | C | ***** HISTORY OF DOCUMENTATION CHANGES ***** | ELCN0004 |
| 5 | C | | ELCN0005 |
| 6 | C | ***** SUNDAY HALLOPS VERSION OF 02X0170 | ELCN0006 |
| 7 | C | | ELCN0007 |
| 8 | C | ***** LANGUAGE FORTRAN IV | ELCN0008 |
| 9 | C | | ELCN0009 |
| 10 | C | ***** MACHINE-00 025 | ELCN0010 |
| 11 | C | | ELCN0011 |
| 12 | C | ***** PURPOSE- | ELCN0012 |
| 13 | C | TO DETERMINE IF THE HAZARD CLOUD WILL BE VIEWED AT AN | ELCN0013 |
| 14 | C | ELEVATION ANGLE GREATER THAN THE GIVEN CONSTRAINT R(3) DURING | ELCN0014 |
| 15 | C | THE ENTIRE EXPERIMENTAL PERIOD? | ELCN0015 |
| 16 | C | | ELCN0016 |
| 17 | C | ***** METHOD- | ELCN0017 |
| 18 | C | FROM EACH TRACKING STATION, A REGION CAN BE DEFINED WITHIN WHICH | ELCN0018 |
| 19 | C | ALL POINTS AT ALTITUDE OF THE HAZARD CLOUD CAN BE VIEWED AT AN | ELCN0019 |
| 20 | C | ELEVATION ANGLE GREATER THAN THE GIVEN CONSTRAINT, THE ARC | ELCN0020 |
| 21 | C | RADIUS OF THIS REGION WITH CENTER AT THE TRACKING STATION IS | ELCN0021 |
| 22 | C | FOUND, THE PROJECTION POINT OF THE TRACKING STATION AND OF THE | ELCN0022 |
| 23 | C | CLOUD IS USED, THE ARC DISTANCE FROM THESE PROJECTED POINTS IS | ELCN0023 |
| 24 | C | THEN CALCULATED AND IF THIS ARC DISTANCE IS LESS THAN THE ARC | ELCN0024 |
| 25 | C | RADIUS OF THE DEFINED REGION THEN THE CONSTRAINT IS MET FOR | ELCN0025 |
| 26 | C | THE OF RELEASE, SUBROUTINE ELDPY IS THEN USED TO DETERMINE IF | ELCN0026 |
| 27 | C | THIS GIVEN CONSTRAINT WILL BE MET FOR THE EXPERIMENTAL PERIOD, | ELCN0027 |
| 28 | C | | ELCN0028 |
| 29 | C | ***** INPUTS | ELCN0029 |
| 30 | C | | ELCN0030 |
| 31 | C | NS - THE NUMBER OF STATIONS USED IN THE PROGRAM | ELCN0031 |
| 32 | C | | ELCN0032 |
| 33 | C | NOB(12) - AN ARRAY CONTAINING THE STATION NUMBERS USED | ELCN0033 |
| 34 | C | | ELCN0034 |
| 35 | C | RVS - RADIAL DISTANCE FROM EARTH CENTER TO RELEASE | ELCN0035 |
| 36 | C | - POINT (ERO) | ELCN0036 |
| 37 | C | | ELCN0037 |
| 38 | C | SINCLT - SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE | ELCN0038 |
| 39 | C | | ELCN0039 |
| 40 | C | COSCLT - COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE | ELCN0040 |
| 41 | C | | ELCN0041 |
| 42 | C | SINCLN - SINE OF RELEASE POINT'S LONGITUDE | ELCN0042 |
| 43 | C | | ELCN0043 |
| 44 | C | COSCLN - COSINE OF RELEASE POINT'S LONGITUDE | ELCN0044 |
| 45 | C | | ELCN0045 |
| 46 | C | NAME(3,12) - NAME OF TRACKING STATIONS USED | ELCN0046 |
| 47 | C | | ELCN0047 |
| 48 | C | RVS(12) - RADIAL VECTOR FROM EARTH CENTER TO TRACKING | ELCN0048 |
| 49 | C | - ELEVATION (ERO) | ELCN0049 |
| 50 | C | | ELCN0050 |
| 51 | C | SINSLT(12) - SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE | ELCN0051 |
| 52 | C | | ELCN0052 |
| 53 | C | COSSLT(12) - COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE | ELCN0053 |
| 54 | C | | ELCN0054 |
| 55 | C | SINSLN(12) - SINE OF TRACKING STATION'S LONGITUDE | ELCN0055 |
| 56 | C | | ELCN0056 |
| 57 | C | COSSLN(12) - COSINE OF TRACKING STATION'S LONGITUDE | ELCN0057 |
| 58 | C | | ELCN0058 |
| 59 | C | R(5) - ELEVATION CONSTRAINT (RADIAN) | ELCN0059 |
| 60 | C | | ELCN0060 |
| 61 | C | R(6) - CLOUD DRY RATE (RAD/ANS/HR) | ELCN0061 |
| 62 | C | | ELCN0062 |
| 63 | C | R(7) - MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS) | ELCN0063 |
| 64 | C | | ELCN0064 |
| 65 | C | HALFPT - VALUE OF 90 DEGREES IN RADIAN | ELCN0065 |
| 66 | C | | ELCN0066 |
| 67 | C | | ELCN0067 |
| 68 | C | ***** OUTPUTS | ELCN0068 |
| 69 | C | | ELCN0069 |
| 70 | C | PRINT STATEMENT NOTED UNDER PROMPT ? IF CONSTRAINT IS NOT MET | ELCN0070 |
| 71 | C | | ELCN0071 |
| 72 | C | | ELCN0072 |
| 73 | C | ***** INTERNAL PARAMETERS | ELCN0073 |
| 74 | C | | ELCN0074 |
| 75 | C | OSCALP - COSINE OF THE ARC RADIUS OF THE DEFINED REGION | ELCN0075 |
| 76 | C | | ELCN0076 |
| 77 | C | L - TRACKING STATION NUMBER | ELCN0077 |

[illegible]

28267 WORDS OF MEMORY USED BY THIS COMPIATION

07900 03 09-85-72 22,634 ELEVATION CONSTRAINT

~~阿爾諾·高爾基~~

| | |
|---------------|-----|
| PROGRAM BREAK | 230 |
| COMMON LENGTH | 6 |
| V COUNT BITS | 9 |

~~PRINCE SYNDICATE LIMITED~~

EUNOR

~~SECONDARY SYNDROME~~ ~~ETRY~~

BLANK **LONGYU**

| | | |
|---|-------|-----|
| 1 | BLN01 | 0 |
| 2 | BLN01 | 10 |
| 3 | BLN0 | 10 |
| 4 | BLN0 | 100 |
| 5 | BLN01 | 70 |
| 6 | BLN0 | 20 |

SUNREF

| | |
|----|-------|
| 7 | COB |
| 10 | AYNN |
| 11 | NOVV |
| 12 | REUPT |
| 13 | NOVV |
| 14 | PHSL |

13 .PRND,
 230 IS THE NEXT AVAILABLE LOCATION.
 CHAP VERSION/ASSEMBLY BYTES JHFA 030178/050571 JHFB 030171/050571 JHPC 030178/050571
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
 64 19332 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY.

07906 02 09-25-72 22.568 CLOUD DRIFT ON ELEVATION CONSTRAINT

*****SUBROUTINE ELVD0001*****

| | | | |
|----|---|---|----------|
| 1 | CLVD | CLOUD DRIFT ON ELEVATION CONSTRAINT | ELVD0001 |
| 2 | *****SUBROUTINE ELVD0001***** | | ELVD0002 |
| 3 | C | | ELVD0003 |
| 4 | *****SYSTEM OF DOCUMENTATION CARDS***** | | ELVD0004 |
| 5 | C | | ELVD0005 |
| 6 | *****HAWAIIAN WALKERS VERSION OF 02X01X70 | | ELVD0006 |
| 7 | C | | ELVD0007 |
| 8 | *****LANGUAGE-FORTRAN IV | | ELVD0008 |
| 9 | C | | ELVD0009 |
| 10 | *****ONLINE-OR 025 | | ELVD0010 |
| 11 | C | | ELVD0011 |
| 12 | *****PURPOSE. | | ELVD0012 |
| 13 | C | TO DETERMINE IF THE ELEVATION CONSTRAINT HOLDS DURING THE | ELVD0013 |
| 14 | C | REQUIRED TRACKING PERIOD? | ELVD0014 |
| 15 | C | | ELVD0015 |
| 16 | *****HAWAIIAN-OR | | ELVD0016 |
| 17 | C | THE LONGITUDINAL DIFFERENCE BETWEEN THE TRACKING STATION TO THE | ELVD0017 |
| 18 | C | EDGE OF THE REGION AT THE LATITUDE OF THE CLOUD ABOUT THIS | ELVD0018 |
| 19 | C | STATION AS DEFINED IN SUBROUTINE ELVD0001 IS FOUND, THERE ARE TWO | ELVD0019 |
| 20 | C | POINTS ON THE EDGE OF THIS REGION AT THE LATITUDE OF THE CLOUD | ELVD0020 |
| 21 | C | WHICH ARE AT AN ARC DISTANCE EQUAL TO THE ARC RADIUS OF THIS | ELVD0021 |
| 22 | C | REGION; FOR AN EASTERN DRIFT ON THE CLOUD AFTER RELEASE THE | ELVD0022 |
| 23 | C | POINT EAST OF THE TRACKING STATION IS REQUIRED, AND FOR THE | ELVD0023 |
| 24 | C | WESTERN DRIFT THE POINT WEST OF THE TRACKING STATION IS | ELVD0024 |
| 25 | C | REQUIRED; THE PROBLEM NOW IS TO FIND OUT HOW LONG IT WILL TAKE | ELVD0025 |
| 26 | C | FOR THE CLOUD TO DRIFT TO THIS POINT ON THE EDGE OF THE DEFINED | ELVD0026 |
| 27 | C | REGION; IF IT IS SHORTER THAN THE GIVEN TRACKING PERIOD THEN THE | ELVD0027 |
| 28 | C | ERROR MESSAGE (FORMAY 1000) IS PRINTED; | ELVD0028 |
| 29 | C | | ELVD0029 |
| 30 | *****INPUTS | | ELVD0030 |
| 31 | C | | ELVD0031 |
| 32 | C | COALP - COSINE OF THE ARC RADIUS OF THE DEFINED REGION | ELVD0032 |
| 33 | C | | ELVD0033 |
| 34 | C | I - TRACKING STATION NUMBER | ELVD0034 |
| 35 | C | | ELVD0035 |
| 36 | C | SINCLY - SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE | ELVD0036 |
| 37 | C | | ELVD0037 |
| 38 | C | COCLY - COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE | ELVD0038 |
| 39 | C | | ELVD0039 |
| 40 | C | NAME(3,12) - NAME OF TRACKING STATIONS USED | ELVD0040 |
| 41 | C | | ELVD0041 |
| 42 | C | RLAND(32) - LONGITUDE OF THE TRACKING STATION (RADIANS) | ELVD0042 |
| 43 | C | | ELVD0043 |
| 44 | C | SINSLY(12) - SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE | ELVD0044 |
| 45 | C | | ELVD0045 |
| 46 | C | COESLY(12) - COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE | ELVD0046 |
| 47 | C | | ELVD0047 |
| 48 | C | R(0) - CLOUD DRIFT RATE (RADIANS/HR) | ELVD0048 |
| 49 | C | | ELVD0049 |
| 50 | C | R(1) - MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS) | ELVD0050 |
| 51 | C | | ELVD0051 |
| 52 | C | | ELVD0052 |
| 53 | *****OUTPUTS | | ELVD0053 |
| 54 | C | | ELVD0054 |
| 55 | C | NAME(3,12) - NAME OF TRACKING STATIONS USED | ELVD0055 |
| 56 | C | | ELVD0056 |
| 57 | C | T - THE CONSTRAINT IS MET FOR GIVEN DRIFT RATE (HR) | ELVD0057 |
| 58 | C | | ELVD0058 |
| 59 | C | R(1) - VALUE OF T IF T=1; INPUT VALUE OF R(1) IN HOURS | ELVD0059 |
| 60 | C | | ELVD0060 |
| 61 | *****RESTRICTIONS. | | ELVD0061 |
| 62 | C | THE DRIFT RATE ON THE CLOUD IS ASSUMED TO BE REFLECTED IN A | ELVD0062 |

| | | | |
|-----|---|--|----------|
| 63 | C | CHANGE ONLY OF LONGITUDE VALUE FOR THE CLOUD'S POSITION AND IS | ELVD0063 |
| 64 | C | ASSUMED TO BE CONSTANT FOR THE EXPERIMENTAL PERIOD; | ELVD0064 |
| 65 | C | THE ELEVATION CONSTRAINT FOR THE POSITION OF THE AIRCRAFT AT | ELVD0065 |
| 66 | C | THE END OF THE EXPERIMENTAL PERIOD IS CALCULATED IN SUBROUTINE | ELVD0066 |
| 67 | C | END | ELVD0067 |
| 68 | C | | ELVD0068 |
| 69 | C | *****SUBPROGRAMS REQUIRED- | ELVD0069 |
| 70 | C | NONE | ELVD0070 |
| 71 | C | | ELVD0071 |
| 72 | C | *****END OF DOCUMENTATION CARDS***** | ELVD0072 |
| 73 | C | | ELVD0073 |
| 74 | | SUBROUTINE ELVD07 (BOSALP,1) | ELVD0074 |
| 75 | | COMMON/BLK1/SINCLV, COSCLV, SINCLN, COSCLN, RVC | ELVD0075 |
| 76 | | COMMON/BLK3/PHI,RLAND | ELVD0076 |
| 77 | | COMMON/BLK17R(8) | ELVD0077 |
| 78 | | COMMON/BLK7/NAME(3,12), PH(12), LPM00(12), ALT(12), MOVE(12) | ELVD0078 |
| 79 | | COMMON/BLK17/SINCLV(12), COSCLV(12), SINCLN(12), COSCLN(12), | ELVD0079 |
| 80 | | RV(12) | ELVD0080 |
| 81 | | COMMON/BLK37/PHI(12), RLAND(12) | ELVD0081 |
| 82 | | REAL LANDX | ELVD0082 |
| 83 | | REAL LONG | ELVD0083 |
| 84 | | ARCOS(X)=ATAN(SQRT(1.0-X*X)/X) | ELVD0084 |
| 85 | C | COMPUTE THE DIFFERENCE IN LONGITUDE FROM THE CENTER OF STATION(1) TO | ELVD0085 |
| 86 | C | THE EDGE OF THE FAVORABLE ELEVATION REGION AT THE CLOUD'S LATITUDE | ELVD0086 |
| 87 | | DEGDEG=ARCOS((COSCLV-SINCLV(1)*SINCLV)/ (COSCLV(1)*COSCLV(1))) | ELVD0087 |
| 88 | C | FIND THE LONGITUDE AT THIS POINT | ELVD0088 |
| 89 | C | IF THE CLOUD IS DRIFTING WESTWARD, FIND THE LONGITUDE WEST OF STATION(1) | ELVD0089 |
| 90 | | IF (RV(12).LT.0.) LONG=LANDX(1)-DEGDEG | ELVD0090 |
| 91 | C | IF THE CLOUD IS DRIFTING EASTWARD, FIND THE LONGITUDE EAST OF STATION(1) | ELVD0091 |
| 92 | | IF (RV(12).GT.0.) LONG=LANDX(1)+DEGDEG | ELVD0092 |
| 93 | C | FIND THE AMOUNT OF TIME (IN HOURS) IT WILL TAKE THE CLOUD TO DRIFT TO | ELVD0093 |
| 94 | C | THIS LONGITUDE | ELVD0094 |
| 95 | | Y=ABS((LONG-RLANDX)/RV(12)) | ELVD0095 |
| 96 | C | IF Y IS LESS THAN THE REQUESTED TRACKING PERIOD THEN PRINT STATEMENT | ELVD0096 |
| 97 | | IF (Y,GE,R(7)) GO TO 10 | ELVD0097 |
| 98 | | WRITE (6,1000) (NAME(J339-J42,3))Y | ELVD0098 |
| 99 | | 11 RETURN | ELVD0099 |
| 100 | | 1000 FORMAT (1X, CLOUD DRIFT CAUSES ELEVATION CONSTRAINT TO FALL BELOW | ELVD0100 |
| 101 | | INPUT CONSTRAINT AT STATION, 34, 45, 29, 19 HOURS AFTER RELEASE) | ELVD0101 |
| 102 | | END | ELVD0102 |

28095 WORDS OF MEMORY USED BY THIS COMPILE

67006 01 09-25-72 11,666 CLOUD DRIFT ON ELEVATION CONSTRAINT

*****SUBROUTINE ELVD07*****

PREFACE

PROGRAM BREAK 175
COMMON LENGTH 0
V COUNT 915

PRIMARY SYMBOL UNIT

ELVD07 0

SECONDARY SYMBOL UNIT

BLK1 LENGTH

| | | |
|---|------|-----|
| 1 | BLK1 | 5 |
| 2 | BLK3 | 8 |
| 3 | BLK1 | 16 |
| 4 | BLK1 | 128 |
| 5 | BLK1 | 76 |
| 6 | BLK3 | 86 |

SYMBOL

7 AVER
10 SERV

11 ,PBRV.
 12 ,PESL,
 13 ,PBRD,
 179 IS THE NEXT AVAILABLE LOCATION.
 CHAP VERSION/ASSEMBLY DATES JHFA 050171/052571 JHFB 050171/052571 JHPC 050171/052571
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
 64 19298 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY

07986 02 09-25-72 13,691 AIRGLOW CALCULATIONS

***** SUBROUTINE AIRGLO *****

| | | | |
|----|--|---|----------|
| 1 | CHIEF | AIRGLOW CALCULATIONS | AIRG0001 |
| 2 | C***** SUBROUTINE AIRGLO ***** | | AIRG0002 |
| 3 | C | | AIRG0003 |
| 4 | C***** VERY OF DOCUMENTATION CARRIES ***** | | AIRG0004 |
| 5 | C | | AIRG0005 |
| 6 | C***** NASA BALLOON VERSION OF 02/01/70 | | AIRG0006 |
| 7 | C | | AIRG0007 |
| 8 | C***** LANGUAGE-FORTRAN IV | | AIRG0008 |
| 9 | C | | AIRG0009 |
| 10 | C***** MACHINE-GE 625 | | AIRG0010 |
| 11 | C | | AIRG0011 |
| 12 | C***** PURPOSE. | | AIRG0012 |
| 13 | C | TO CALCULATE THE AIRGLOW BRIGHTNESS AS DEFINED FOR THE WIS | AIRG0013 |
| 14 | C | PROJECT. | AIRG0014 |
| 15 | C | | AIRG0015 |
| 16 | C***** METHOD. | | AIRG0016 |
| 17 | C | THIS SUBROUTINE CALCULATES A VECTOR BETWEEN THE GEOCENTRIC | AIRG0017 |
| 18 | C | COORDINATES OF THE STATION AND THE RELEASE POINT, THE ANGLE | AIRG0018 |
| 19 | C | BETWEEN THIS VECTOR AND THE ZENITH OF THE STATION IS COMPUTED, | AIRG0019 |
| 20 | C | FROM THIS ANGLE THE AIRGLOW BRIGHTNESS IS COMPUTED. | AIRG0020 |
| 21 | C | IT ALSO USES SUBROUTINE SPAIN TO COMPUTE THE AIRGLOW BRIGHTNESS | AIRG0021 |
| 22 | C | AT DISCRETE POINTS FROM EACH TRACKING STATION TO THE CLOUD'S | AIRG0022 |
| 23 | C | POSITION AFTER RELEASE. | AIRG0023 |
| 24 | C | | AIRG0024 |
| 25 | C***** INPUT. | | AIRG0025 |
| 26 | C | | AIRG0026 |
| 27 | C | CONX -GEOCENTRIC X COMPONENT OF RELEASE POINT (ERU) | AIRG0027 |
| 28 | C | | AIRG0028 |
| 29 | C | CONY -GEOCENTRIC Y COMPONENT OF RELEASE POINT (ERU) | AIRG0029 |
| 30 | C | | AIRG0030 |
| 31 | C | CONZ -GEOCENTRIC Z COMPONENT OF RELEASE POINT (ERU) | AIRG0031 |
| 32 | C | | AIRG0032 |
| 33 | C | SONX(12) -GEOCENTRIC X COMPONENT OF TRACKING STATION (ERU) | AIRG0033 |
| 34 | C | | AIRG0034 |
| 35 | C | SONY(12) -GEOCENTRIC Y COMPONENT OF TRACKING STATION (ERU) | AIRG0035 |
| 36 | C | | AIRG0036 |
| 37 | C | SONZ(12) -GEOCENTRIC Z COMPONENT OF TRACKING STATION (ERU) | AIRG0037 |
| 38 | C | | AIRG0038 |
| 39 | C | PHI(12) -GEOCENTRIC LATITUDE OF TRACKING STATION (DEG) | AIRG0039 |
| 40 | C | | AIRG0040 |
| 41 | C | SINSLN(12) - SINE OF TRACKING STATION'S LONGITUDE | AIRG0041 |
| 42 | C | | AIRG0042 |
| 43 | C | COSSLN(12) -COSINE OF TRACKING STATION'S LONGITUDE | AIRG0043 |
| 44 | C | | AIRG0044 |
| 45 | C | NT(9) -MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS) | AIRG0045 |
| 46 | C | | AIRG0046 |
| 47 | C | NS -THE NUMBER OF STATIONS USED IN THE PROGRAM | AIRG0047 |
| 48 | C | | AIRG0048 |
| 49 | C | NOB(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED | AIRG0049 |
| 50 | C | | AIRG0050 |
| 51 | C | DTH -CONVERSION FACTOR FROM DEGREES TO RADIANS | AIRG0051 |
| 52 | C | | AIRG0052 |
| 53 | C | | AIRG0053 |
| 54 | C***** OUTPUT. | | AIRG0054 |
| 55 | C | | AIRG0055 |
| 56 | C | UX -GEOCENTRIC X COMPONENT OF VECTOR FROM STATION TO | AIRG0056 |
| 57 | C | RELEASE POINT (ERU) | AIRG0057 |
| 58 | C | | AIRG0058 |
| 59 | C | UY -GEOCENTRIC Y COMPONENT OF VECTOR FROM STATION TO | AIRG0059 |
| 60 | C | RELEASE POINT (ERU) | AIRG0060 |

| Line | Code | Text | Address | Count |
|------|------|---|----------|-------|
| 61 | C | | AIRG0061 | |
| 62 | C | WZ -GEOCENTRIC Z COMPONENT OF VECTOR FROM STATION TO | AIRG0062 | |
| 63 | C | -RELEASE POINT THERU) | AIRG0063 | |
| 64 | C | | AIRG0064 | |
| 65 | C | USX -X-COMPONENT OF UNIT VECTOR IN DIRECTION OF | AIRG0065 | |
| 66 | C | -TRACKING STATION'S ZENITH | AIRG0066 | |
| 67 | C | | AIRG0067 | |
| 68 | C | USY -Y-COMPONENT OF UNIT VECTOR IN DIRECTION OF | AIRG0068 | |
| 69 | C | -TRACKING STATION'S ZENITH | AIRG0069 | |
| 70 | C | | AIRG0070 | |
| 71 | C | USZ -Z-COMPONENT OF UNIT VECTOR IN DIRECTION OF | AIRG0071 | |
| 72 | C | -TRACKING STATION'S ZENITH | AIRG0072 | |
| 73 | C | | AIRG0073 | |
| 74 | C | BA(12,7) -AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE | AIRG0074 | |
| 75 | C | -GIVEN POSITION OF THE CLOUD (RAYLEIGHS) | AIRG0075 | |
| 76 | C | | AIRG0076 | |
| 77 | C | C(12,7) -EFFICIENT DEPENDENT UPON THE RELATIVE POSITIONAL | AIRG0077 | |
| 78 | C | -OF THE TRACKING STATION TO THE CLOUD AND USED TO | AIRG0078 | |
| 79 | C | -SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS | AIRG0079 | |
| 80 | C | | AIRG0080 | |
| 81 | C | JEND -NUMBER OF DISCRETE VALUES STORED FOR | AIRG0081 | |
| 82 | C | -EXPERIMENTAL PERIOD DATA | AIRG0082 | |
| 83 | C | | AIRG0083 | |
| 84 | C | *****RESTRICTIONS- | AIRG0084 | |
| 85 | C | UP TO TWELVE TRACKING STATIONS CAN BE USED AND UP TO SEVEN | AIRG0085 | |
| 86 | C | DISCRETE VALUES FOR AIRGLOW BRIGHTNESS CAN BE COMPUTED FOR EACH | AIRG0086 | |
| 87 | C | TRACKING STATION. | AIRG0087 | |
| 88 | C | | AIRG0088 | |
| 89 | C | *****PROGRAMS REQUIRED- | AIRG0089 | |
| 90 | C | EMAIR | AIRG0090 | |
| 91 | C | | AIRG0091 | |
| 92 | C | *****REMARK- | AIRG0092 | |
| 93 | C | ONLY ELEVEN TRACKING STATIONS CAN BE USED IF ONE OF THESE | AIRG0093 | |
| 94 | C | STATIONS IS A MOVING OR DISCRETE STATION. | AIRG0094 | |
| 95 | C | | AIRG0095 | |
| 96 | C | *****END OF DOCUMENTATION CARDS***** | AIRG0096 | |
| 97 | C | | AIRG0097 | |
| 98 | C | SUBROUTINE AIRGLO | AIRG0098 | |
| 99 | C | COMMON/BLK2/ GCX, GCY, GCZ | AIRG0099 | |
| 100 | C | COMMON/BLK1/ R(1) | AIRG0100 | |
| 101 | C | COMMON/BLK2/ NS, NOS(12) | AIRG0101 | |
| 102 | C | COMMON/BLK2/ NAME(3,12), PH1(12), LAMBDA(12), ALT(12), MOVE(12) | AIRG0102 | |
| 103 | C | COMMON/BLK1/ SINSLN(12), COSSLN(12), SINSLN(12), COSSLN(12), | AIRG0103 | |
| 104 | C | 1 RVS(12) | AIRG0104 | |
| 105 | C | COMMON/BLK2/ SECX(12), SECY(12), SECZ(12) | AIRG0105 | |
| 106 | C | COMMON/BLK2/ DTR, RTR, MTR, HALFT, RTH, AU, DELTA(4), ERM, DGM | AIRG0106 | |
| 107 | C | COMMON/BLK2/ WX(12), WY(12), WZ(12), BA(12,7), C(12,7), JEND | AIRG0107 | |
| 108 | C | COMMON/BLK4/ USX, USY, USZ | AIRG0108 | |
| 109 | C | REAL LAMBDA, LAMBDA, LAMBDA, LAMBDA | AIRG0109 | |
| 110 | C | DOUBLE PRECISION DTR, RTR, MTR, HALFT | AIRG0110 | |
| 111 | C | C CALCULATE VALUE FOR JEND | AIRG0111 | |
| 112 | C | JEND = (1.0 + 2.0 * R(1)) | AIRG0112 | |
| 113 | C | DO 100 L=1,NS | AIRG0113 | 2 |
| 114 | C | I = NOS(L) | AIRG0114 | 3 |
| 115 | C | C COMPUTE COMPONENTS OF W VECTOR AND ITS MAGNITUDE | AIRG0115 | |
| 116 | C | WX(I) = GCX - SECX(I) | AIRG0116 | 4 |
| 117 | C | WY(I) = GCY - SECY(I) | AIRG0117 | 9 |
| 118 | C | WZ(I) = GCZ - SECZ(I) | AIRG0118 | 6 |
| 119 | C | WVZ = SQRT(WX(I)*WX(I) + WY(I)*WY(I) + WZ(I)*WZ(I)) | AIRG0119 | 7 |
| 120 | C | C COMPUTE UNIT VECTOR IN DIRECTION OF STATION ZENITH | AIRG0120 | |
| 121 | C | YTH = COS(PHI(I) * DTR) | AIRG0121 | 8 |
| 122 | C | USX = YTH * COSSLN(I) | AIRG0122 | 9 |
| 123 | C | USY = YTH * SINSLN(I) | AIRG0123 | 10 |
| 124 | C | USZ = SIN(PHI(I) * DTR) | AIRG0124 | 11 |
| 125 | C | C CALCULATE AIRGLOW BRIGHTNESS FOR STATION(I) | AIRG0125 | |
| 126 | C | SECZ = WVZ / (USX * WX(I) + USY * WY(I) + USZ * WZ(I)) | AIRG0126 | 12 |
| 127 | C | C(1,3) = 0.0 * SECZ | AIRG0127 | 13 |
| 128 | C | BA(I,7) = 0.0 * SECZ | AIRG0128 | 14 |
| 129 | C | C CALL SPAN ONLY IF REQUIRED TO CALCULATE WINDOW TIMES FOR A TRACKING | AIRG0129 | |
| 130 | C | C PERIOD | AIRG0130 | |
| 131 | C | IF (JEND * GT 1) CALL EMATR (I) | AIRG0131 | 19 |
| 132 | C | 100 CONTINUE | AIRG0132 | 10 |
| 133 | C | 10 CONTINUE | AIRG0133 | 20 |

134 RETURN
135 END

AIRG0834 21
AIRG0835 22

28989 WORDS OF MEMORY USED BY THIS COMPILATION

67906 01 09-25-72 33,696 AIRGLOW CALCULATIONS

***** SUBROUTINE AIRGLO *****

PREFACE

PROGRAM BREAK 265
COMMON LENGTH 8
V SECTY BITS 5

PRIMARY SYMDEF ENTRY

AIRGLO 8

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

| | | |
|----|-------|-----|
| 1 | BLK02 | 3 |
| 2 | BLK01 | 10 |
| 3 | BLK0 | 15 |
| 4 | BLK0 | 129 |
| 5 | BLK01 | 76 |
| 6 | BLK02 | 49 |
| 7 | BLK0 | 20 |
| 10 | BLK0 | 315 |
| 11 | BLK04 | 3 |

SYNDEF

12 COS
13 SIN
14 SUBV
15 ENGR
16 FDEP2

265 IS THE NEXT AVAILABLE LOCATION.
CHAP VERSION/ASSEMBLY DATES JHPA 050171/052571 JHRB 050171/052571 JHPC 050171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
66 19365 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY

67906 01 09-25-72 33,702 AIRGLOW DURING TRACKING PERIOD

***** SUBROUTINE EPA18 *****

| | | | |
|----|-------|--|----------|
| 1 | CEPAT | AIRGLOW DURING TRACKING PERIOD | EPA10001 |
| 2 | C | ***** SUBROUTINE EPA18 ***** | EPA10002 |
| 3 | C | | EPA10003 |
| 4 | C | ***** START OF DOCUMENTATION CARDS ***** | EPA10004 |
| 5 | C | | EPA10005 |
| 6 | C | ***** NAGA HALLOPS VERSION OF 02/01/70 | EPA10006 |
| 7 | C | | EPA10007 |
| 8 | C | ***** LANGUAGE FORTRAN IV | EPA10008 |
| 9 | C | | EPA10009 |
| 10 | C | ***** MACHINE GE 625 | EPA10010 |
| 11 | C | | EPA10011 |
| 12 | C | PURPOSE. | EPA10012 |
| 13 | C | TO CALCULATE THE DIFFERENT AIRGLOW BRIGHTNESS FOR EACH THIRTY | EPA10013 |
| 14 | C | (30) MINUTE TIME INTERVAL DURING THE DESIRED EXPERIMENT TIME, | EPA10014 |
| 15 | C | | EPA10015 |
| 16 | C | ***** METHOD. | EPA10016 |
| 17 | C | THE GEOCENTRIC X-Y-Z-COMPONENTS OF THE VECTOR FROM EARTH CENTER | EPA10017 |
| 18 | C | TO THE CLOUD IS MODIFIED AT 30 MINUTE INCREMENTS TO INCORPORATE | EPA10018 |
| 19 | C | ITS POSITION AFTER RELEASE DUE TO THE EAST/WEST DRIFT OF THE | EPA10019 |
| 20 | C | CLOUD. THE CLOUD DRIFT IS ASSUMED TO BE CONSTANT AND IN THE SAME | EPA10020 |
| 21 | C | DIRECTION AND IS ASSUMED TO BE SOLELY A CHANGE IN LONGITUDE | EPA10021 |

| | | | |
|----|---|--|----------|
| 22 | C | ANGLE; THE X,Y,Z-COMPONENTS OF THE VECTOR FROM STATION(1) TO THE | EPAI0022 |
| 23 | C | POSITION OF THE CLOUD AT DISCRETE POINTS DURING THE | EPAI0023 |
| 24 | C | EXPERIMENTAL PERIOD IS CALCULATED; THE AIRFLOW BRIGHTNESS AND | EPAI0024 |
| 25 | C | ITS COEFFICIENT VALUES ARE FOUND AS IN SUBROUTINE AIRGLE FOR | EPAI0025 |
| 26 | C | THESE POINTS, | EPAI0026 |
| 27 | C | THE ELEVATION CONSTRAINT FOR THE LAST POSITION OF THE MOVING | EPAI0027 |
| 28 | C | TRACKING STATION IS CHECKED USING THE ZENITH ANGLE(SECZ), | EPAI0028 |
| 29 | C | | EPAI0029 |
| 30 | C | *****INPUT* | EPAI0030 |
| 31 | C | | EPAI0031 |
| 32 | C | I -INDEX FOR STATION NUMBER | EPAI0032 |
| 33 | C | | EPAI0033 |
| 34 | C | JEND -NUMBER OF DISCRETE VALUES STORED FOR | EPAI0034 |
| 35 | C | -EXPERIMENTAL PERIOD DATA | EPAI0035 |
| 36 | C | | EPAI0036 |
| 37 | C | R(6) -CLOUD DRIET RATE (RAD/ANS/HR) | EPAI0037 |
| 38 | C | | EPAI0038 |
| 39 | C | CGSX -GEOCENTRIC X COMPONENT OF RELEASE POINT (ERU) | EPAI0039 |
| 40 | C | | EPAI0040 |
| 41 | C | CGSY -GEOCENTRIC Y COMPONENT OF RELEASE POINT (ERU) | EPAI0041 |
| 42 | C | | EPAI0042 |
| 43 | C | CGSZ -GEOCENTRIC Z COMPONENT OF RELEASE POINT (ERU) | EPAI0043 |
| 44 | C | | EPAI0044 |
| 45 | C | SGSX(12) -GEOCENTRIC X COMPONENT OF TRACKING STATION (ERU) | EPAI0045 |
| 46 | C | | EPAI0046 |
| 47 | C | SGSY(12) -GEOCENTRIC Y COMPONENT OF TRACKING STATION (ERU) | EPAI0047 |
| 48 | C | | EPAI0048 |
| 49 | C | SGSZ(12) -GEOCENTRIC Z COMPONENT OF TRACKING STATION (ERU) | EPAI0049 |
| 50 | C | | EPAI0050 |
| 51 | C | USX -X-COMPONENT OF UNIT VECTOR IN DIRECTION OF | EPAI0051 |
| 52 | C | -TRACKING STATION'S ZENITH | EPAI0052 |
| 53 | C | | EPAI0053 |
| 54 | C | USY -Y-COMPONENT OF UNIT VECTOR IN DIRECTION OF | EPAI0054 |
| 55 | C | -TRACKING STATION'S ZENITH | EPAI0055 |
| 56 | C | | EPAI0056 |
| 57 | C | USZ -Z-COMPONENT OF UNIT VECTOR IN DIRECTION OF | EPAI0057 |
| 58 | C | -TRACKING STATION'S ZENITH | EPAI0058 |
| 59 | C | | EPAI0059 |
| 60 | C | PLAT(7) -GEOGRAPHIC LATITUDE OF AIRCRAFT DURING | EPAI0060 |
| 61 | C | -EXPERIMENTAL PERIOD (DEG) | EPAI0061 |
| 62 | C | | EPAI0062 |
| 63 | C | SIGLON(7) -SINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL | EPAI0063 |
| 64 | C | -PERIOD | EPAI0064 |
| 65 | C | | EPAI0065 |
| 66 | C | COSLON(7) -COSINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL | EPAI0066 |
| 67 | C | -PERIOD | EPAI0067 |
| 68 | C | | EPAI0068 |
| 69 | C | ASGX(7) -GEOCENTRIC X COMPONENT OF AIRCRAFT POSITION | EPAI0069 |
| 70 | C | -DURING EXPERIMENTAL PERIOD (ERU) | EPAI0070 |
| 71 | C | | EPAI0071 |
| 72 | C | ASGY(7) -GEOCENTRIC Y COMPONENT OF AIRCRAFT POSITION | EPAI0072 |
| 73 | C | -DURING EXPERIMENTAL PERIOD (ERU) | EPAI0073 |
| 74 | C | | EPAI0074 |
| 75 | C | ASGZ(7) -GEOCENTRIC Z COMPONENT OF AIRCRAFT POSITION | EPAI0075 |
| 76 | C | -DURING EXPERIMENTAL PERIOD (ERU) | EPAI0076 |
| 77 | C | | EPAI0077 |
| 78 | C | MOVE(12) -CODE NUMBER TO DETERMINE IF STATION COORDINATES | EPAI0078 |
| 79 | C | -ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT | EPAI0079 |
| 80 | C | -00, FOR FIXED STATION | EPAI0080 |
| 81 | C | -01, FOR AIRCRAFT | EPAI0081 |
| 82 | C | | EPAI0082 |
| 83 | C | DTR -CONVERSION FACTOR FROM DEGREES TO RADIANS | EPAI0083 |
| 84 | C | | EPAI0084 |
| 85 | C | | EPAI0085 |
| 86 | C | *****OUTPUT* | EPAI0086 |
| 87 | C | | EPAI0087 |
| 88 | C | WPX(12,7) -VALUE OF GEOCENTRIC X COMPONENT OF VECTOR FROM | EPAI0088 |
| 89 | C | -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE | EPAI0089 |
| 90 | C | | EPAI0090 |
| 91 | C | WPY(12,7) -VALUE OF GEOCENTRIC Y COMPONENT OF VECTOR FROM | EPAI0091 |
| 92 | C | -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE | EPAI0092 |
| 93 | C | | EPAI0093 |
| 94 | C | WPZ(12,7) -VALUE OF GEOCENTRIC Z COMPONENT OF VECTOR FROM | EPAI0094 |

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95 C -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE EPA10095
96 C EPA10096
97 C BA(12,7) -AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE EPA10097
98 C -GIVEN POSITION OF THE CLOUD (RAYLEIGHS) EPA10098
99 C EPA10099
100 C C(12,7) -COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION EPA10100
101 C -OF THE TRACKING STATION TO THE CLOUD AND USED TO EPA10101
102 C -SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS EPA10102
103 C EPA10103
104 C *****RESTRICTIONS- EPA10104
105 C UP TO TWELVE TRACKING STATIONS CAN BE USED AND UP TO SEVEN EPA10105
106 C DISCRETE VALUES FOR AIRGLOW BRIGHTNESS CAN BE COMPUTED FOR EACH EPA10106
107 C TRACKING STATION. EPA10107
108 C EPA10108
109 C *****SUBPROGRAMS REQUIRED- EPA10109
110 C NONE EPA10110
111 C EPA10111
112 C *****REMARK- EPA10112
113 C ONLY ELEVEN TRACKING STATIONS CAN BE USED AS INPUT IF ONE OF EPA10113
114 C THESE STATIONS IS AN AIRCRAFT. EPA10114
115 C EPA10115
116 C *****END OF DOCUMENTATION CARDS***** EPA10116
117 C EPA10117
118 SUBROUTINE EBATH (I) EPA10118
119 COMMON/BLK027 C0CX, C0CY, C0CZ EPA10119
120 COMMON/BLK017R(8) EPA10120
121 COMMON/BLK07 NAME(3,12), PHZ(12), LMBD0(12), ALT(12), MOVE(12) EPA10121
122 COMMON/BLK027 S0CX(12), S0CY(12), S0CZ(12) EPA10122
123 COMMON/BLK047 PNAME(3,7), PLAT(7), PLON(7), PALY(7), JAIR EPA10123
124 COMMON/BLK057 SINLAT(7), COSLAT(7), SINLON(7), COSLON(7), REA(7) EPA10124
125 COMMON/BLK067 A0CX(7), A0CY(7), A0CZ(7) EPA10125
126 COMMON/BLK07 DTR, RVD, MYR, HALP(2), RYN, AU, DELTA(4), ERM, BGHA EPA10126
127 COMMON/BLK07 PHZ(12), W(12), WZ(12), BA(12,7), C(12,7), JE0D EPA10127
128 COMMON/BLK047 USX, USY, USZ EPA10128
129 COMMON/BLK057 WPX(12,7), WPY(12,7), WPZ(12,7) EPA10129
130 DOUBLE PRECISION DTR, RVD, MYR, HALP(2) EPA10130
131 DO 100 J=2,JE0D EPA10131
132 TJ = J EPA10132
133 C CALCULATE THE CHANGE IN THE CLOUD'S LONGITUDE FOR TJ HOURS AFTER EPA10133
134 C RELEASE AND CALCULATE ITS SINE AND COSINE. EPA10134
135 T = 0.508(TJ-1) EPA10135
136 CS = COS(T) EPA10136
137 SN = SIN(T) EPA10137
138 C DETERMINE THE X,Y,Z-COMPONENTS OF THE VECTOR FROM EARTH CENTER TO THE EPA10138
139 C CLOUD TJ HOURS AFTER RELEASE. EPA10139
140 C0CXP = (C0CX*CS)-(C0CY*SN) EPA10140
141 C0CYP = (C0CX*SN)+(C0CY*CS) EPA10141
142 C0CZP = C0CZ EPA10142
143 IF (MOVE(1,50,0)) GO TO 11 EPA10143
144 C FIND THE UNIT VECTOR IN THE DIRECTION OF THE AIRCRAFT'S POSITION AT EPA10144
145 C TJ HOURS INTO TRACKING PERIOD. EPA10145
146 Y0MP = COS(PLAT(J)*DTR) EPA10146
147 USX = Y0MP * COSLON(J) EPA10147
148 USY = Y0MP * SINLON(J) EPA10148
149 USZ = SIN(PLAT(J)*DTR) EPA10149
150 C FIND THE VECTOR FROM THE AIRCRAFT TO THE CLOUD TJ HOURS AFTER RELEASE EPA10150
151 WPX(1,J) = C0CXP - A0CX(J) EPA10151
152 WPY(1,J) = C0CYP - A0CY(J) EPA10152
153 WPZ(1,J) = C0CZP - A0CZ(J) EPA10153
154 GO TO 12 EPA10154
155 C FIND THE VECTOR FROM STATION(I) TO THE CLOUD TJ HOURS AFTER RELEASE EPA10155
156 S1 WPX(1,J) = S0CX(1) EPA10156
157 WPY(1,J) = S0CY(1) EPA10157
158 WPZ(1,J) = S0CZ(1) EPA10158
159 S2 WPXYZ = 1.0 / SQRT(WPX(1,J)**2 + WPY(1,J)**2 + WPZ(1,J)**2) EPA10159
160 W1 = WPX(1,J)*WPXYZ EPA10160
161 W2 = WPY(1,J)*WPXYZ EPA10161
162 W3 = WPZ(1,J)*WPXYZ EPA10162
163 W4 = WPX(1,J)*WPXYZ EPA10163
164 C FIND THE AIRGLOW BRIGHTNESS AND USE VALUE FOR THE ABOVE VECTOR EPA10164
165 S0CZ = 1.07 (USX*W1 + USY*W2 + USZ*W3) EPA10165
166 C(1,J) = 0.73*S0CZ EPA10166
167 BA(1,J) = 1.07*S0CZ EPA10167

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| | | | |
|-----|--|----------|----|
| 168 | IF (MOVE(1),0.0) RETURN | EPA10268 | 31 |
| 169 | C DETERMINE IF ELEVATION CONSTRAINT IS MET FOR THE AIRCRAFT AT THE END | EPA10269 | |
| 170 | C OF THE TRACKING PERIOD | EPA10270 | |
| 171 | COMPUTESORT(SECZ-SECZ-0.0)XSECZ | EPA10271 | 34 |
| 172 | IF (COMPUT(07,(COS(R(2)))) WRITE (0,1000) | EPA10272 | 35 |
| 173 | 20 CONTINUE | EPA10273 | 39 |
| 174 | RETURN | EPA10274 | 40 |
| 175 | 1000 FORMATTING, 95*****ELEVATION CONSTRAINT NOT MET FOR AIRCRAFT | EPA10275 | 41 |
| 176 | 1 STATION AT END OF TRACKING PERIOD*****//) | EPA10276 | |
| 177 | END | EPA10277 | 41 |

23935 WORDS OF MEMORY USED BY THIS COMPILE

07906 01 09-25-72 11,710 AIRCRAFT DURING TRACKING PERIOD

*****SUBROUTINE EPAIR *****

PREPAGE

PROGRAM BREAK 648
COMMON LENGTH 0
V COUNT BYTS 5

PRIMARY SYMDEF ENTRY

EPAIR 0

SECONDARY SYMDEF ENTRY

| | BLOCK | LENGTH |
|----|-------|--------|
| 1 | BLK02 | 3 |
| 2 | BLK01 | 10 |
| 3 | BLK0 | 120 |
| 4 | BLK02 | 44 |
| 5 | BLK04 | 58 |
| 6 | BLK05 | 46 |
| 7 | BLK06 | 29 |
| 10 | BLK0 | 20 |
| 11 | BLK0 | 319 |
| 12 | BLK04 | 5 |
| 13 | BLK05 | 370 |

SYMDEF

14 COS
15 SIN
16 SORT
17 ,FDRP2
20 ,FESL,
21 ,FWRD,

443 IS THE NEXT AVAILABLE LOCATION,
GNAP VERSION/ASSEMBLY BYTES JMPA 050171/052571 JMRB 050171/052571 J MPC 050171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
04 19488 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY

07906 01 09-25-72 11,710 POLARIS FUNCTION TIME

*****SUBROUTINE TIME *****

| | | | |
|----|--|---|----------|
| 1 | C TIME | POLARIS FUNCTION TIME | TIME0001 |
| 2 | C*****SUBROUTINE TIME ***** | | TIME0002 |
| 3 | C | | TIME0003 |
| 4 | C*****SUBSTANT OR DOCUMENTATION CARDS***** | | TIME0004 |
| 5 | C | | TIME0005 |
| 6 | C | FUNCTION TIME (DAYRUM) | TIME0006 |
| 7 | C | | TIME0007 |
| 8 | C | PURPOSE | TIME0008 |
| 9 | C | TO COMPUTE THE GREENWICH MEAN SIDEREAL TIME AT ZERO HOURS | TIME0009 |
| 10 | C | UNIVERSAL TIME FOR ANY JULIAN DATE AFTER 2415020.0 ON | TIME0010 |

| | | | | |
|----|---|--|----------|---|
| 11 | C | JANUARY 0,1900 | TIME0011 | |
| 12 | C | | TIME0012 | |
| 13 | C | LANGUAGE | TIME0013 | |
| 14 | C | FORTRAN IV | TIME0014 | |
| 15 | C | | TIME0015 | |
| 16 | C | CALLING SEQUENCE | TIME0016 | |
| 17 | C | GMSIDT = TIME(DAYNUM) (TIME IS A DOUBLE PRECISION FUNCTION) | TIME0017 | |
| 18 | C | | TIME0018 | |
| 19 | C | INPUTS | TIME0019 | |
| 20 | C | DAYNUM = JULIAN DATE AT ZERO HOURS UNIVERSAL TIME | TIME0020 | |
| 21 | C | | TIME0021 | |
| 22 | C | OUTPUTS | TIME0022 | |
| 23 | C | TIME(DAYNUM) = GREENWICH MEAN SIDEREAL TIME AT ZERO HOURS | TIME0023 | |
| 24 | C | UNIVERSAL, (HOUR ANGLE OF THE FIRST POINT OF ARIES?) | TIME0024 | |
| 25 | C | ANSWER IS IN HOURS AND DECIMAL FRACTIONS OF HOURS, TO | TIME0025 | |
| 26 | C | CONVERT TO DEGREES MULTIPLY BY 15.0 (DOUBLE PRECISION) | TIME0026 | |
| 27 | C | | TIME0027 | |
| 28 | C | REFERENCE | TIME0028 | |
| 29 | C | 1) AMERICAN EPHEMERIS AND NAUTICAL ALMANAC, 1961 | TIME0029 | |
| 30 | C | 2) EXPLANATORY SUPPLEMENT TO AMERICAN EPHEMERIS AND | TIME0030 | |
| 31 | C | NAUTICAL ALMANAC, HER MAJESTY'S STATIONARY OFFICE, LONDON | TIME0031 | |
| 32 | C | | TIME0032 | |
| 33 | C | METHOD | TIME0033 | |
| 34 | C | VALUES OF GREENWICH MEAN SIDEREAL TIME ARE OBTAINED BY AD | TIME0034 | |
| 35 | C | TWELVE HOURS TO NEWCOMBS VA, PTA, EY 01898, PART 1) EXP | TIME0035 | |
| 36 | C | FOR THE RIGHT ASCENSION OF THE MEAN SUN, | TIME0036 | |
| 37 | C | | TIME0037 | |
| 38 | C | RESTRICTIONS | TIME0038 | |
| 39 | C | NONE KNOWN | TIME0039 | |
| 40 | C | | TIME0040 | |
| 41 | C | SUBPROGRAMS REQUIRED | TIME0041 | |
| 42 | C | NONE | TIME0042 | |
| 43 | C | | TIME0043 | |
| 44 | C | ANALYSIS | TIME0044 | |
| 45 | C | FRANK E. MOSE | TIME0045 | |
| 46 | C | APPLIED MATH SECTION | TIME0046 | |
| 47 | C | NASA | TIME0047 | |
| 48 | C | Wallops Station, VA. | TIME0048 | |
| 49 | C | | TIME0049 | |
| 50 | C | PROGRAMMER | TIME0050 | |
| 51 | C | DENNIS MELVIN | TIME0051 | |
| 52 | C | APPLIED MATH SECTION | TIME0052 | |
| 53 | C | NASA | TIME0053 | |
| 54 | C | Wallops Station, VA. | TIME0054 | |
| 55 | C | | TIME0055 | |
| 56 | C | *****END OF DOCUMENTATION CARDS***** | TIME0056 | |
| 57 | C | | TIME0057 | |
| 58 | C | DOUBLE PRECISION FUNCTION TIME(DAYNUM) | TIME0058 | |
| 59 | C | | TIME0059 | |
| 60 | C | DOUBLE PRECISION C1,C2,C3,RUP12,TO | TIME0060 | |
| 61 | C | | TIME0061 | |
| 62 | C | DATA Y1900,C1,C2,C3/241902070.6,0.05666555555555556D00,2.40005126166 | TIME0062 | |
| 63 | C | 1666667D03,2,58055555555555556D-07X | TIME0063 | |
| 64 | C | | TIME0064 | |
| 65 | C | TH=(DAYNUM-Y1900)/36525.0 | TIME0065 | |
| 66 | C | | TIME0066 | |
| 67 | C | RUP12=C2*TO | TIME0067 | 2 |
| 68 | C | | TIME0068 | |
| 69 | C | K1= RUP12/24.0 | TIME0069 | 3 |
| 70 | C | | TIME0070 | |
| 71 | C | RUP12=RUP12- FLOAT(K1) *24.0 | TIME0071 | 4 |
| 72 | C | | TIME0072 | |
| 73 | C | TIME = C1 + RUP12 *C3*TH**2 | TIME0073 | 5 |
| 74 | C | | TIME0074 | |
| 75 | C | IF (TIME<0) 1,2:18 | TIME0075 | 6 |
| 76 | C | | TIME0076 | |
| 77 | C | 2 TIME =TIME-24.0 | TIME0077 | 7 |
| 78 | C | | TIME0078 | |
| 79 | C | 1 RETURN | TIME0079 | 8 |
| 80 | C | | TIME0080 | |
| 81 | C | END | TIME0081 | 9 |

67906 01 09-25-72 11,722

POLARIS FUNCTION TIME

*****ROUTINE TIME *****

PREFACE

PROGRAM BREAK 110
COMMON LENGTH 0
V COUNT DIVS 5

PRIMARY SYMDEF ENTRY

TIME 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

SYMDEF

110 IS THE NEXT AVAILABLE LOCATION.

GMAP VERSION/ASSEMBLY DATES JMAP 090171/052571 JMRB 090171/052571 JMPC 090171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
** 19202 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

67906 01 09-25-72 11,722

POLARIS FUNCTION DAYNUM

*****ROUTINE DAYNUM *****

| | | | |
|----|-------|--|----------|
| 1 | CDAYN | POLARIS FUNCTION DAYNUM | DAYN0001 |
| 2 | C | *****SUBROUTINE DAYNUM ***** | DAYN0002 |
| 3 | C | | DAYN0003 |
| 4 | C | *****START OF DOCUMENTATION CARDS***** | DAYN0004 |
| 5 | C | | DAYN0005 |
| 6 | C | FUNCTION DAYNUM(MONTH, DAY, YEAR) | DAYN0006 |
| 7 | C | | DAYN0007 |
| 8 | C | PURPOSE | DAYN0008 |
| 9 | C | TO COMPUTE THE JULIAN DATE AT ZERO HOURS UNIVERSAL TIME | DAYN0009 |
| 10 | C | FOR ANY DAY FROM THE YEAR 2800 TO THE YEAR 2000 | DAYN0010 |
| 11 | C | | DAYN0011 |
| 12 | C | LANGUAGE | DAYN0012 |
| 13 | C | FORTRAN IV | DAYN0013 |
| 14 | C | | DAYN0014 |
| 15 | C | CALLING SEQUENCE | DAYN0015 |
| 16 | C | Y = DAYNUM(MONTH, DAY, YEAR) | DAYN0016 |
| 17 | C | YEAR, AND DAY BEING FLOATING POINT VARIABLES, | DAYN0017 |
| 18 | C | MONTH BEING AN INTEGER VARIABLE | DAYN0018 |
| 19 | C | | DAYN0019 |
| 20 | C | INPUTS | DAYN0020 |
| 21 | C | MONTH = CALENDAR MONTH (INTEGER) | DAYN0021 |
| 22 | C | DAY = CALENDAR DAY (FLOATING POINT) | DAYN0022 |
| 23 | C | YEAR = CALENDAR YEAR (FLOATING POINT) | DAYN0023 |
| 24 | C | | DAYN0024 |
| 25 | C | OUTPUTS | DAYN0025 |
| 26 | C | DAYNUM = JULIAN DAY NUMBER AT ZERO HOUR FOR THE ABOVE DATE | DAYN0026 |
| 27 | C | | DAYN0027 |
| 28 | C | REFERENCE | DAYN0028 |
| 29 | C | 1, AMERICAN EPHEMERIS AND NAUTICAL ALMANAC | DAYN0029 |
| 30 | C | | DAYN0030 |
| 31 | C | METHOD | DAYN0031 |
| 32 | C | THE NUMBER OF DAYS ELAPSED FROM ZERO HOURS UNIVERSAL TIME, | DAYN0032 |
| 33 | C | JANUARY 0, 1600 ARE ADDED TO THE JULIAN DAY NUMBER OF THAT | DAYN0033 |
| 34 | C | PARTICULAR DAY (250944875) | DAYN0034 |
| 35 | C | | DAYN0035 |
| 36 | C | RESTRICTIONS | DAYN0036 |
| 37 | C | PROGRAM CHECKED TO THE YEAR 2000 A.D. | DAYN0037 |
| 38 | C | | DAYN0038 |
| 39 | C | SUBPROGRAMS REQUIRED | DAYN0039 |
| 40 | C | NONE | DAYN0040 |
| 41 | C | | DAYN0041 |
| 42 | C | ANALYSTS | DAYN0042 |
| 43 | C | FRANK E. MOSE | DAYN0043 |

| Line | Code | Statement | Address | Count |
|------|------|---|----------|-------|
| 44 | C | APPLIED MATHEMATICS SECTION | DAYN0044 | |
| 45 | C | WACLOPS STATION, VA? | DAYN0045 | |
| 46 | C | | DAYN0046 | |
| 47 | C | PROGRAMMER | DAYN0047 | |
| 48 | C | DENNIS MELVIN | DAYN0048 | |
| 49 | C | APPLIED MATHEMATICS SECTION | DAYN0049 | |
| 50 | C | WACLOPS STATION, VA? | DAYN0050 | |
| 51 | C | | DAYN0051 | |
| 52 | C | *****END OF DOCUMENTATION CARDS***** | DAYN0052 | |
| 53 | C | | DAYN0053 | |
| 54 | | FUNCTION DAYNUM (MONTH, DAY, YEAR) | DAYN0054 | |
| 55 | C | | DAYN0055 | |
| 56 | | REAL MONTH(12) | DAYN0056 | |
| 57 | C | | DAYN0057 | |
| 58 | | DATA (MONTH(1) 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 6 | | |

28559 WORDS OF MEMORY USED BY THIS COMPIATION

67906 01 09-85-72 11,732

POLARIS FUNCTION DAYNUM

*****ROUTINE DAYNUM *****

PREFACE

| | |
|---------------|-----|
| PROGRAM BREAK | 258 |
| COMMON LENGTH | 0 |
| V COUNT 0195 | 9 |

PRIMARY SYNDROME ENTRY

DAYTON

~~SECONDARY SYMBOL ENTRY~~

| BLOCK | LENGTH |
|-------|--------|
| 1 | 10 |
| 2 | 10 |
| 3 | 10 |
| 4 | 10 |
| 5 | 10 |
| 6 | 10 |
| 7 | 10 |
| 8 | 10 |
| 9 | 10 |
| 10 | 10 |
| 11 | 10 |
| 12 | 10 |
| 13 | 10 |
| 14 | 10 |
| 15 | 10 |
| 16 | 10 |
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| 87 | 10 |
| 88 | 10 |
| 89 | 10 |
| 90 | 10 |
| 91 | 10 |
| 92 | 10 |
| 93 | 10 |
| 94 | 10 |
| 95 | 10 |
| 96 | 10 |
| 97 | 10 |
| 98 | 10 |
| 99 | 10 |
| 100 | 10 |

SVNREF

213 IS THE NEXT AVAILABLE LOCATION,
GNAP VERSION/ASSEMBLY DATES JMPA 050176/052571 JMRB 050171/052571 JMPC 050171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
68 19218 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY.

67906 01 09-25-72 11,738 SUN AND MOON ELEVATION CONSTRAINTS

*****SUBROUTINE SUNMN*****

| | | | |
|----|--|---|----------|
| 1 | CSUNM | SUN AND MOON ELEVATION CONSTRAINTS | SUNM0001 |
| 2 | CS*****SUBROUTINE SUNMN***** | | SUNM0002 |
| 3 | C | | SUNM0003 |
| 4 | CS*****START OF DOCUMENTATION CARDS***** | | SUNM0004 |
| 5 | C | | SUNM0005 |
| 6 | CS*****NASA WALLBPS VERSION OF 02/01/70 | | SUNM0006 |
| 7 | C | | SUNM0007 |
| 8 | CS*****LANGUAGE-FORTRAN IV | | SUNM0008 |
| 9 | C | | SUNM0009 |
| 10 | CS*****MACHINE-GE 025 | | SUNM0010 |
| 11 | C | | SUNM0011 |
| 12 | CS*****PURPOSE- | | SUNM0012 |
| 13 | C | TO DETERMINE THE DAILY TIME INTERVAL FOR WHICH THE SUN AND MOON | SUNM0013 |
| 14 | C | WILL BE BELOW THE RESPECTIVE ELEVATION ANGLES AT EACH TRACKING | SUNM0014 |
| 15 | C | STATION'S LOCAL HORIZON, | SUNM0015 |
| 16 | C | | SUNM0016 |
| 17 | CS*****METHOD- | | SUNM0017 |
| 18 | C | THE SOLUTION FOR DETERMINING THE TIME PERIODS FOR WHICH THE SUN | SUNM0018 |
| 19 | C | AND MOON CONSTRAINTS ARE MET FOR EACH STATION ARE DEVELOPED | SUNM0019 |
| 20 | C | USING SIMILAR ANALYSIS, AN APPROXIMATE TIME FOR THE DEFINED | SUNM0020 |
| 21 | C | CONSTRAINT (SUN OR MOON) TO BE MET IS DETERMINED FROM THE | SUNM0021 |
| 22 | C | FIRST INTERVAL FOR THE DAY PLUS DELTA(M), THE POSITION OF THE | SUNM0022 |
| 23 | C | SUN OR MOON FOR THAT TIME IS FOUND AND IS THEN TRANSFORMED TO | SUNM0023 |
| 24 | C | THE TOPOCENTRIC COORDINATES ON THE TRACKING STATION, THE | SUNM0024 |
| 25 | C | ELEVATION ANGLE OF THE SUN (OR MOON) AT THIS TRACKING STATION | SUNM0025 |
| 26 | C | IS FOUND FOR THE CURRENT POSITION OF THE SUN (MOON), A THREE | SUNM0026 |
| 27 | C | POINT INTERPOLATION METHOD IS USED TO APPROXIMATE THE NEXT | SUNM0027 |
| 28 | C | GUESS AT THE TIME FOR WHICH THE CONSTRAINT IS MET, THE PROCESS | SUNM0028 |
| 29 | C | OF DEFINING THE POSITION OF THE SUN (MOON) FOR THE LATEST | SUNM0029 |
| 30 | C | UNIVERSAL TIME, TRANSFORMING TO TOPOCENTRIC COORDINATES AND | SUNM0030 |
| 31 | C | CHECKING THE ELEVATION ANGLE IS REPEATED UNTIL EITHER A TIME IS | SUNM0031 |
| 32 | C | FOUND FOR WHICH THE RATIO OF THE ELEVATION ANGLE TO THE | SUNM0032 |
| 33 | C | REQUIRED CONSTRAINT IS ACCURATE TO .0001 OR THAT THE ITERATIVE | SUNM0033 |
| 34 | C | PROCESS IS TOO LONG AND IMPLIES A WEAK CONVERGENCE OR | SUNM0034 |
| 35 | C | DIVERGENCE, THE TIME PERIOD FOUND IS STORED AS THE SECOND TIME | SUNM0035 |
| 36 | C | PERIOD FOR THE DAY, THE MAIN PROGRAM TREATS THIS AS THE FIRST | SUNM0036 |
| 37 | C | TIME PERIOD OF THE NEXT DAY BY SUBTRACTING 24 HOURS FROM THESE | SUNM0037 |
| 38 | C | VALUES, | SUNM0038 |
| 39 | C | IF A MOVING TRACKING STATION IS INPUT, THEN THE TIME OF DAY | SUNM0039 |
| 40 | C | FOR WHICH ITS POSITION AT THE END OF THE EXPERIMENTAL PERIOD | SUNM0040 |
| 41 | C | SATISFIES THE SUN AND MOON ELEVATION CONSTRAINTS IS FOUND, | SUNM0041 |
| 42 | C | THESE TIMES ARE STORED IN THE WINDOW ARRAY AND THE WINDOW TIMES | SUNM0042 |
| 43 | C | FOR THE MOVING TRACKING STATION ARE DETERMINED SUCH THAT THE | SUNM0043 |
| 44 | C | SUN AND MOON CONSTRAINTS WILL BE SATISFIED FOR ITS POSITION AT | SUNM0044 |
| 45 | C | TIME OF RELEASE AND DURING THE EXPERIMENTAL PERIOD, | SUNM0045 |
| 46 | C | | SUNM0046 |
| 47 | CS*****INPUTS | | SUNM0047 |
| 48 | C | | SUNM0048 |
| 49 | C | NS -THE NUMBER OF STATIONS USED IN THE PROGRAM | SUNM0049 |
| 50 | C | | SUNM0050 |
| 51 | C | NOS(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED | SUNM0051 |
| 52 | C | | SUNM0052 |
| 53 | C | WINDOW(5,5,12) -THE DAILY RELEASE WINDOW START/STOP TIMES, | SUNM0053 |
| 54 | C | -1ST INDEX FOR STORING START/STOP TIMES, | SUNM0054 |
| 55 | C | -1 FOR START TIME | SUNM0055 |
| 56 | C | -2 FOR STOP TIME | SUNM0056 |
| 57 | C | -2ND INDEX FOR THE CONSTRAINT | SUNM0057 |
| 58 | C | = 3:SUN | SUNM0058 |
| 59 | C | = 4:MOON | SUNM0059 |
| 60 | C | -3RD INDEX FOR THE STATION NUMBER | SUNM0060 |
| 61 | C | | SUNM0061 |
| 62 | C | MYEAR -YEAR NUMBER FOR STARTING CALCULATIONS | SUNM0062 |
| 63 | C | | SUNM0063 |
| 64 | C | I -CURRENT NUMBER OF DAYS PAST JANUARY 0 OF MYEAR | SUNM0064 |
| 65 | C | | SUNM0065 |
| 66 | C | M -INDEX TO INDICATE CONSTRAINT | SUNM0066 |
| 67 | C | = 3:SUN | SUNM0067 |
| 68 | C | = 4:MOON | SUNM0068 |
| 69 | C | | SUNM0069 |
| 70 | C | DELTA(3) -APPROXIMATE PERIOD OF SUN MOTION (HRS) | SUNM0070 |

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|-----|---|-------------|--|----------|
| 71 | C | | | SUNM0071 |
| 72 | C | DELTA(4) | =APPROXIMATE PERIOD OF MOON MOTION (HRS) | SUNM0072 |
| 73 | C | | | SUNM0073 |
| 74 | C | NAME(3,12) | =NAME OF TRACKING STATIONS USED | SUNM0074 |
| 75 | C | | | SUNM0075 |
| 76 | C | LAMBDA(12) | =LONGITUDE OF TRACKING STATION (DEG) | SUNM0076 |
| 77 | C | | | SUNM0077 |
| 78 | C | RVS(12) | =RADIUS VECTOR FROM EARTH CENTER TO TRACKING STATION (ERU) | SUNM0078 |
| 79 | C | | | SUNM0079 |
| 80 | C | | | SUNM0080 |
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| 82 | C | | =UNIVERSAL TIME (HRS) | SUNM0082 |
| 83 | C | | | SUNM0083 |
| 84 | C | R(3) | =SUN ELEVATION CONSTRAINT (RADIAN) | SUNM0084 |
| 85 | C | | | SUNM0085 |
| 86 | C | R(4) | =MOON ELEVATION CONSTRAINT (RADIAN) | SUNM0086 |
| 87 | C | | | SUNM0087 |
| 88 | C | ANS(3) | =DISTANCE FROM EARTH CENTER TO SUN (ASTRONOMICAL UNITS) | SUNM0088 |
| 89 | C | | | SUNM0089 |
| 90 | C | | | SUNM0090 |
| 91 | C | ANS(4) | =INERTIAL X COMPONENT OF VECTOR FROM EARTH CENTER TO SUN (AU) | SUNM0091 |
| 92 | C | | | SUNM0092 |
| 93 | C | | | SUNM0093 |
| 94 | C | ANS(5) | =INERTIAL Y COMPONENT OF VECTOR FROM EARTH CENTER TO SUN (AU) | SUNM0094 |
| 95 | C | | | SUNM0095 |
| 96 | C | | | SUNM0096 |
| 97 | C | ANS(6) | =INERTIAL Z COMPONENT OF VECTOR FROM EARTH CENTER TO SUN (AU) | SUNM0097 |
| 98 | C | | | SUNM0098 |
| 99 | C | | | SUNM0099 |
| 100 | C | ANS(9) | =DISTANCE FROM EARTH CENTER TO MOON (ERU) | SUNM0100 |
| 101 | C | | | SUNM0101 |
| 102 | C | ANS(10) | =INERTIAL X COMPONENT OF VECTOR FROM EARTH CENTER TO MOON (ERU) | SUNM0102 |
| 103 | C | | | SUNM0103 |
| 104 | C | | | SUNM0104 |
| 105 | C | ANS(11) | =INERTIAL Y COMPONENT OF VECTOR FROM EARTH CENTER TO MOON (ERU) | SUNM0105 |
| 106 | C | | | SUNM0106 |
| 107 | C | | | SUNM0107 |
| 108 | C | ANS(12) | =INERTIAL Z COMPONENT OF VECTOR FROM EARTH CENTER TO MOON (ERU) | SUNM0108 |
| 109 | C | | | SUNM0109 |
| 110 | C | | | SUNM0110 |
| 111 | C | AGG27C(3,3) | =ELEMENTS OF TRANSFORMATION MATRIX FROM THE INERTIAL SYSTEM TO THE TOPOCENTRIC SYSTEM | SUNM0111 |
| 112 | C | | | SUNM0112 |
| 113 | C | | | SUNM0113 |
| 114 | C | DTR | =CONVERSION FACTOR FROM DEGREES TO RADIAN | SUNM0114 |
| 115 | C | | | SUNM0115 |
| 116 | C | RTM | =CONVERSION FACTOR FROM RADIAN TO HOURS | SUNM0116 |
| 117 | C | | | SUNM0117 |
| 118 | C | MTM | CONVERSION FACTOR FROM HOURS TO RADIAN | SUNM0118 |
| 119 | C | | | SUNM0119 |
| 120 | C | AU | =CONVERSION FACTOR FROM ASTRONOMICAL UNITS TO EARTH RADIUS UNITS | SUNM0120 |
| 121 | C | | | SUNM0121 |
| 122 | C | | | SUNM0122 |
| 123 | C | MOVE(12) | =CODE NUMBER TO DETERMINE IF STATION COORDINATES ARE FOR EARTH FIXED STATION OR FOR AIRCRAFT | SUNM0123 |
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| 125 | C | | =1, FOR AIRCRAFT | SUNM0125 |
| 126 | C | | | SUNM0126 |
| 127 | C | | | SUNM0127 |
| 128 | C | SINLAT(7) | =SINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING EXPERIMENTAL PERIOD | SUNM0128 |
| 129 | C | | | SUNM0129 |
| 130 | C | | | SUNM0130 |
| 131 | C | COBLAT(7) | =COSINE OF AIRCRAFT GEOCENTRIC LATITUDE DURING EXPERIMENTAL PERIOD | SUNM0131 |
| 132 | C | | | SUNM0132 |
| 133 | C | | | SUNM0133 |
| 134 | C | SINLON(7) | =SINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL PERIOD | SUNM0134 |
| 135 | C | | | SUNM0135 |
| 136 | C | | | SUNM0136 |
| 137 | C | COBLON(7) | =COSINE OF AIRCRAFT LONGITUDE DURING EXPERIMENTAL PERIOD | SUNM0137 |
| 138 | C | | | SUNM0138 |
| 139 | C | | | SUNM0139 |
| 140 | C | RVA(7) | =DISTANCE FROM EARTH CENTER TO AIRCRAFT DURING EXPERIMENTAL PERIOD (ERU) | SUNM0140 |
| 141 | C | | | SUNM0141 |
| 142 | C | | | SUNM0142 |
| 143 | C | RLAT(7) | =GEOCENTRIC LATITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIOD (RADIAN) | SUNM0143 |
| 144 | C | | | SUNM0144 |


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145 C SUNM0145
146 C ALOR(7) -LONGITUDE OF AIRCRAFT DURING EXPERIMENTAL PERIODSUNM0146
147 C - (RADIANS) SUNM0147
148 C SUNM0148
149 C JEND -NUMBER OF DISCRETE VALUES STORED FOR SUNM0149
150 C -EXPERIMENTAL PERIOD DATA SUNM0150
151 C SUNM0151
152 C SUNM0152
153 C*****OUTPUT- SUNM0153
154 C SUNM0154
155 C DELTA(3) -APPROXIMATE PERIOD OF SUN MOTION (HRS) SUNM0155
156 C SUNM0156
157 C DELTA(4) -APPROXIMATE PERIOD OF MOON MOTION (HRS) SUNM0157
158 C SUNM0158
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160 C -1ST INDEX FOR STORING START/STOP TIMES, SUNM0160
161 C -3 FOR START TIME SUNM0161
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165 C - 4-MOON SUNM0165
166 C -3RD INDEX FOR THE STATION NUMBER SUNM0166
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168 C*****RESTRICTIONS- SUNM0168
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170 C ROUTINE DEPENDS UPON THE AVAILABLE DATA ON THE SUN AND MOON SUNM0170
171 C POSITION TO BE DEFINED IN THE EPHEMERIS TABLES FOR THE DATES SUNM0171
172 C REQUIRED; PRESENT VERSION CONTAINS DATA FOR THE YEARS 1969,1970, SUNM0172
173 C 1971; ADDITIONAL DATA CAN BE MADE AVAILABLE WHEN NECESSARY? SUNM0173
174 C SUNM0174
175 C*****SUBPROGRAMS REQUIRED- SUNM0175
176 C RDBPH SUNM0176
177 C ERHEMERIS TABLES SUNM0177
178 C GC2YC SUNM0178
179 C SUNM0179
180 C*****REMARK- SUNM0180
181 C ONLY ELEVEN TRACKING STATIONS CAN BE USED AS INPUT IF ONE OF SUNM0181
182 C THESE STATIONS IS AN AIRCRAFT; SUNM0182
183 C SUNM0183
184 C*****END OF DOCUMENTATION CARD***** SUNM0184
185 C SUNM0185
186 SUBROUTINE SUNMN (I,M) SUNM0186
187 COMMON/BLKX /XMONTH,XDAY ,RYEAR ,LMONTH,LDAY ,LYEAR ,KHO, KDA, SUNM0187
188 1 KYR, LNO, LDA, LPR, TOLC, IPRY7, IPRT9, IPRT21, IPLOT SUNM0188
189 COMMON/BLKE1/R(8) SUNM0189
189 COMMON/BLKE /NS, NOS(12) SUNM0190
190 COMMON/BLKB /NAME(3,12), PH1(12), LMBDA(12), ALT(12), MOVE(12) SUNM0191
191 COMMON/BLKE2/ SINSLT(12), COSSLT(12), SINSLN(12), COSSLN(12); SUNM0192
192 1 RVSL(12) SUNM0193
193 COMMON/BLKE5/SINLAT(7), COSLAT(7), SINLON(7), COSLON(7), RUA(7) SUNM0194
194 COMMON/BLKE7/RLAT(7), RLON(7) SUNM0195
195 COMMON/BLKE /DTR, RTDY, WTR, HALFT, RTH, AU, DELTA(4), ERM, DGWA SUNM0196
196 COMMON/BLKE/ SUNL, GHA SUNM0197
197 COMMON/BLKM/ WINDOW(6,7,12) SUNM0198
198 COMMON/BLKY /WX(12), WY(12), WZ(12), BA(12,7), CA(12,7), JEND SUNM0199
199 COMMON /TMATRX/ AGC2TC(3,8) SUNM0200
200 DOUBLE PRECISION DYN, RVD, MYO, HALFT; SUNM0201
201 DIMENSION XNS(12) SUNM0202
202 REAL LAMBDA; SUNM0203
203 C SUNM0204
204 C ARGSI(B,X) =ATAN(X/SQRT(1.0-X**2)) SUNM0205
205 C FIND START TIME THRU STOP TIME FOR WHEN SUN OR MOON RESTRICTION IS METSUNM0206
206 C FOR EACH TRACKING STATION SUNM0207
207 LYEAR = 0 SUNM0208
208 DO 100 L=1,NS SUNM0209
209 J = (NOS(L)) SUNM0210
210 C KEEP FIRST WINDOW TIMES LESS THAN 24 HOURS SUNM0211
211 IF (MOVE(J),EO,0) GO TO 41 SUNM0212
212 NYEAR = NOS(RS) + 1 SUNM0213
213 IF (WINDOW(2,MVJ),GE,24.0) GO TO 31 SUNM0214
214 IF (WINDOW(2,MVTEMP),LY,24.0) GO TO 31 SUNM0215
215 51 WINDOW(3,M,J) = WINDOW(1,M,J) SUNM0216
216 WINDOW(4,M,J) = WINDOW(1,M,J) SUNM0217
217 WINDOW(3,M,NTMP) = WINDOW(2,M,NTMP) SUNM0218
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215 WINDOW(4TH,NTERR) = WINDOW(2TH,NTERR) SUNH0219 17
220 WINDOW(3TH,NT) = ANXI-WINDOW(5TH,NT) / (WINDOW(5TH,NTERR)-R(7)) SUNH0220 18
221 WINDOW(4TH,NT) = ANXI-WINDOW(5TH,NT) / (WINDOW(5TH,NTERR)-R(7)) SUNH0221 19
222 WINDOW(1TH,NTERR) = WINDOW(5TH,NTERR) - 24.0 SUNH0222 20
223 WINDOW(2TH,NTERR) = WINDOW(5TH,NTERR) - 24.0 SUNH0223 21
224 GO TO 100 SUNH0224 22
225 IF (WINDOW(2TH,NT) .LT. 24.0) GO TO 31 SUNH0225 23
226 WINDOW(3TH,NT) = WINDOW(5TH,NT) SUNH0226 24
227 WINDOW(4TH,NT) = WINDOW(5TH,NT) SUNH0227 25
228 GO TO 100 SUNH0228 26
229 IF DO 200 K = 112 SUNH0229 27
230 ITER = 0 SUNH0230 28
231 C SET FIRST GUESS FOR TIME FOR WHICH RESTRICTION IS MET SUNH0231 29
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233 C SKIP TO 40 IF THIS IS AIRCRAFT ELEVATION SUNH0233 31
234 IF (J,EO,LYERR) GO TO 40 SUNH0234 32
235 C FIND HOUR ANGLE FOR STATION(J) IN RADIANS SUNH0235 33
236 OMGA = SINX (UT-OMGA) * MYR + LAMBDA (J) * DTR SUNH0236 34
237 GO TO 40 SUNH0237 35
238 OMGA = SINX (UT-OMGA) * MYR + LAMBDA (J) * DTR SUNH0238 36
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241 C DETERMINE ELEVATION ANGLE FOR SUN/MOON AT TIME UT BY TRANSFORMING TO SUNH0241 39
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243 CALL RDPH (OMGA,J) SUNH0243 41
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245 IF (J,EO,LYERR) GO TO 40 SUNH0245 43
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247 C FOR THE SUN USE THE FOLLOWING, FOR THE MOON SKIP TO 12 SUNH0247 45
248 IF (M,EO,4) GO TO 12 SUNH0248 46
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250 1 X = RVS(J) SUNH0250 48
251 XHAB = ANS(3) / AU - RVS(J) SUNH0251 49
252 GO TO 12 SUNH0252 50
253 C SUNH0253 51
254 C CALCULATE XHAB FOR MOON SUNH0254 52
255 IF X = AGC2TC(1,1) * ANS(14) + AGC2TC(2,2) * ANS(15) + AGC2TC(1,3) * ANS(16) SUNH0255 53
256 1 X = RVS(J) SUNH0256 54
257 XHAB = ANS(3) / AU - RVS(J) SUNH0257 55
258 GO TO 12 SUNH0258 56
259 IF (M,EO,4) GO TO 43 SUNH0259 57
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262 XHAB = ANS(3) / AU - RVS(J) SUNH0262 60
263 GO TO 12 SUNH0263 61
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266 XHAB = ANS(3) / AU - RVS(J) SUNH0266 64
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291 ELV1 = ELV SUNH0291 89

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| 292 | 87 IF (H,EG,2) DTC=DT | SUNH0292 | 91 |
| 293 | C USE NEGATIVE OR DELTA TIME IF ERROR TIME IS BEING COMPUTED | SUNH0293 | |
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| 302 | 87 IF (J,EG,LYEMP) GO TO 42 | SUNH0302 | 100 |
| 303 | JTEMP 6J | SUNH0303 | 103 |
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| 312 | C MAKE TIMES FOUND FOR AIRCRAFT POSITION AT END OF TRACKING PERIOD THE | SUNH0312 | |
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| 314 | WINDOW(13H,J) & WINDOW(13H,J) -2470 | SUNH0314 | 112 |
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| 317 | 100 CONTINUE | SUNH0317 | 115 |
| 318 | 80 CONTINUE | SUNH0318 | 117 |
| 319 | RETURN | SUNH0319 | 118 |
| 320 | END | SUNH0320 | 119 |

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26899 WORDS OF MEMORY USED BY THIS COMPILE/ION

~~67906 03 09-25-72 23,749~~

SUN AND NOON ECHOSPECTION CONSTRAINTS

*****BAPTIST PIONEER*****

PREFACE

PROGRAM BREAK 1208

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| 99 | 0.000 | 0.000 |
| 100 | 0.000 | 0.000 |

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| 10 | 1000 | 10 |
| 11 | 1000 | 11 |

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| 12 | 550 |
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13 8600 889

5444

15 APR 1964

10 01

17 GUNVC

20 :RDRM
21 :PENV,
22 :PRIT,
23 :FPL,
24 :PRND,

1202 IS THE NEXT AVAILABLE LOCATION.

GNAP VERSION/ASSEMBLY DATES JHFA 050171/052571 JHRB 050171/052571 JMPC 050171/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

19799 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY.

67906 01 09-25-72 11,754 INERTIAL TO TOPOCENTRIC TRANSFORMATION

*****SUBROUTINE GCCTC*****

| | | | |
|----|-------|--|-----------|
| 1 | GCCTC | INERTIAL TO TOPOCENTRIC TRANSFORMATION | GCCTC0001 |
| 2 | C | *****SUBROUTINE GCCTC***** | GCCTC0002 |
| 3 | C | | GCCTC0003 |
| 4 | C | *****START OF DOCUMENTATION CARDS***** | GCCTC0004 |
| 5 | C | | GCCTC0005 |
| 6 | C | *****NASA Wallops version of 02/01/70 | GCCTC0006 |
| 7 | C | | GCCTC0007 |
| 8 | C | *****LANGUAGE=FORTRAN IV | GCCTC0008 |
| 9 | C | | GCCTC0009 |
| 10 | C | *****MACHINE=GE 625 | GCCTC0010 |
| 11 | C | | GCCTC0011 |
| 12 | C | *****PURPOSE. | GCCTC0012 |
| 13 | C | TO COMPUTE THE ELEMENTS OF THE TRANSFORMATION MATRIX FOR THE | GCCTC0013 |
| 14 | C | ROTATION FROM INERTIAL RECTANGULAR COORDINATES TO A TOPOCENTRIC | GCCTC0014 |
| 15 | C | SYSTEM WITH ORIGIN AT THE ORIGIN OF THE INERTIAL SYSTEM. | GCCTC0015 |
| 16 | C | | GCCTC0016 |
| 17 | C | *****METHOD. | GCCTC0017 |
| 18 | C | GIVEN A POINT OF GEOCENTRIC LATITUDE AND LONGITUDE AND THE | GCCTC0018 |
| 19 | C | CURRENT HOUR ANGLE, CALCULATE THE ELEMENTS OF THE TRANSFORMATION | GCCTC0019 |
| 20 | C | MATRIX. COORDINATE TRANSFORMATION BY THIS MATRIX WILL TRANSFORM | GCCTC0020 |
| 21 | C | THE COMPONENTS FROM AN INERTIAL RECTANGULAR SYSTEM TO A | GCCTC0021 |
| 22 | C | TOPOCENTRIC SYSTEM. THE INERTIAL COORDINATE SYSTEM IS DEFINED AS | GCCTC0022 |
| 23 | C | HAVING ITS ORIGIN AT THE EARTH'S CENTER WITH THE X-AXIS IN THE | GCCTC0023 |
| 24 | C | DIRECTION OF THE FIRST POINT OF ARIES, THE Y-AXIS IN THE | GCCTC0024 |
| 25 | C | EQUATORIAL PLANE 90 DEGREES COUNTERCLOCKWISE FROM X AND THE Z- | GCCTC0025 |
| 26 | C | AXIS DIRECTED TOWARDS THE ZENITH IN A RIGHT HANDED SYSTEM. THE | GCCTC0026 |
| 27 | C | TOPOCENTRIC SYSTEM HAS ITS X-AXIS DIRECTED TOWARDS THE | GCCTC0027 |
| 28 | C | GEOCENTRIC INPUT POINT, THE Z-AXIS DIRECTED TOWARD THE SAME | GCCTC0028 |
| 29 | C | LATITUDE BUT AT 180 DEGREES FROM THE INPUT LONGITUDE AND THE Y- | GCCTC0029 |
| 30 | C | AXIS POSITIONED AS TO COMPLETE THE RIGHT HANDED SYSTEM, | GCCTC0030 |
| 31 | C | | GCCTC0031 |
| 32 | C | *****INPUT. | GCCTC0032 |
| 33 | C | | GCCTC0033 |
| 34 | C | HA -THE STATION'S HOUR ANGLE (RADJANS) | GCCTC0034 |
| 35 | C | | GCCTC0035 |
| 36 | C | J -THE INDEX NUMBER OF THE STATION | GCCTC0036 |
| 37 | C | | GCCTC0037 |
| 38 | C | NOB(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED | GCCTC0038 |
| 39 | C | | GCCTC0039 |
| 40 | C | NS -THE NUMBER OF STATIONS USED IN THE PROGRAM | GCCTC0040 |
| 41 | C | | GCCTC0041 |
| 42 | C | SINSLY(12) -SINE OF TRACKING STATION'S GEOCENTRIC LATITUDE | GCCTC0042 |
| 43 | C | | GCCTC0043 |
| 44 | C | COSSLY(12) -COSINE OF TRACKING STATION'S GEOCENTRIC LATITUDE | GCCTC0044 |
| 45 | C | | GCCTC0045 |
| 46 | C | SINLAT(12) -SINE OF AVERAGE GEOCENTRIC LATITUDE DURING | GCCTC0046 |
| 47 | C | -EXPERIMENTAL PERIOD | GCCTC0047 |
| 48 | C | | GCCTC0048 |
| 49 | C | COSLAT(12) -COSINE OF AVERAGE GEOCENTRIC LATITUDE DURING | GCCTC0049 |
| 50 | C | -EXPERIMENTAL PERIOD | GCCTC0050 |
| 51 | C | | GCCTC0051 |
| 52 | C | | GCCTC0052 |
| 53 | C | *****OUTPUT. | GCCTC0053 |
| 54 | C | | GCCTC0054 |
| 55 | C | A02YC(3,3) -ELEMENTS OF TRANSFORMATION MATRIX FROM THE | GCCTC0055 |
| 56 | C | INERTIAL SYSTEM TO THE TOPOCENTRIC SYSTEM | GCCTC0056 |
| 57 | C | | GCCTC0057 |
| 58 | C | *****RESTRICTIONS. | GCCTC0058 |
| 59 | C | NS CANNOT BE GREATER THAN TWELVE. | GCCTC0059 |

| | | | | |
|----|----|---|----------|----|
| 60 | C | | GCYC0060 | |
| 61 | C | *****SUBPROGRAMS REQUIRED- | GCYC0061 | |
| 62 | C | None | GCYC0062 | |
| 63 | C | | GCYC0063 | |
| 64 | C | *****END OF DOCUMENTATION CARDS***** | GCYC0064 | |
| 65 | C | | GCYC0065 | |
| 66 | | SUBROUTINE GC2TC(HA, J) | GCYC0066 | |
| 67 | | COMMON/BLK97NS, NOS(12) | GCYC0067 | |
| 68 | | COMMON/BLK91/ SINSLY(12), COSLY(12), SINSLN(12), COSSLN(12), | GCYC0068 | |
| 69 | 1 | RVS(12) | GCYC0069 | |
| 70 | | COMMON/BLK95/SINLAY(7), COSLAY(7), SINLON(7), COSLON(7), RVA(7) | GCYC0070 | |
| 71 | | COMMON/BLK97/WX(12), WY(12), UZ(12), BA(12,7), C(12,7), JEND | GCYC0071 | |
| 72 | | COMMON/THXTRX/ AGC2T8(13,3) | GCYC0072 | |
| 73 | C | SHIP TO 12 IF TRANSFORMATION IS ON A SCAFF LOCATION AFTER RELEASE | GCYC0073 | |
| 74 | | IF (J,GT,NOS(NS)) GO TO 11 | GCYC0074 | |
| 75 | | SINLY =SINSLY(J) | GCYC0075 | 4 |
| 76 | | COSLY =COSSLY(J) | GCYC0076 | 5 |
| 77 | | GO TO 12 | GCYC0077 | 6 |
| 78 | 11 | SINLY =SINLAY(JEND) | GCYC0078 | 7 |
| 79 | | COSLY =COSLAY(JEND) | GCYC0079 | 8 |
| 80 | C | DEFINE THE ELEMENTS OF THE TRANSFORMATION MATRIX | GCYC0080 | |
| 81 | 12 | SINHA = SIN(HA) | GCYC0081 | 9 |
| 82 | | COSHA = COS(HA) | GCYC0082 | 10 |
| 83 | | AGC2T8(1,1) = COSLY * COSHA | GCYC0083 | 11 |
| 84 | | AGC2T8(1,2) = COSLY * SINHA | GCYC0084 | 12 |
| 85 | | AGC2T8(1,3) = SINLY | GCYC0085 | 13 |
| 86 | | AGC2T8(2,1) = -SINHA | GCYC0086 | 14 |
| 87 | | AGC2T8(2,2) = COSHA | GCYC0087 | 15 |
| 88 | | AGC2T8(2,3) = 0.0 | GCYC0088 | 16 |
| 89 | | AGC2T8(3,1) = -SINLY * COSHA | GCYC0089 | 17 |
| 90 | | AGC2T8(3,2) = -SINLY * SINHA | GCYC0090 | 18 |
| 91 | | AGC2T8(3,3) = COSLY | GCYC0091 | 19 |
| 92 | | RETURN | GCYC0092 | 20 |
| 93 | | END | GCYC0093 | 21 |

23987 WORDS OF MEMORY USED BY THIS COMPILATION

67906 01 09-25-72 11,768 INERTIAL TO TOROGENTRIC TRANSFORMATION

*****SUBROUTINE GC2TC*****

PREFACE

PROGRAM BREAK 114
COMMON LENGTH 0
V COUNT 8175

PRIMARY SYMDEF EN144

GC2VC 0

SECONDARY SYMDEF EN144

BLK91 LENGTH

| | | |
|---|--------|-----|
| 1 | BLN9 | 15 |
| 2 | BLN91 | 74 |
| 3 | BLN95 | 43 |
| 4 | BLN9 | 315 |
| 5 | THXTRX | 11 |

SYMDEF

6 COS
7 SIN

114 IS THE NEXT AVAILABLE LOCATION.

GNAP VERSION/ASSEMBLY DATES JHMA 050174/052571 JHMB 050171/052571 JHPC 050174/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

19292 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY.

67906 01 09-25-72 11,766 EARTH SHADOW CONSTRAINT

*****SUBROUTINE ILLUM*****

| | | | | |
|----|---|---|---|----------|
| 1 | C | ILLU | EARTH SHADOW CONSTRAINT | ILLU0001 |
| 2 | C | *****SUBROUTINE ILLUM***** | | ILLU0002 |
| 3 | C | | | ILLU0003 |
| 4 | C | *****START OF DOCUMENTATION CROSS***** | | ILLU0004 |
| 5 | C | | | ILLU0005 |
| 6 | C | *****NASA WALLOPS VERSION OF 02X01470 | | ILLU0006 |
| 7 | C | | | ILLU0007 |
| 8 | C | *****LANGUAGE-FORTRAN IV | | ILLU0008 |
| 9 | C | | | ILLU0009 |
| 10 | C | *****MACHINE-GE 025 | | ILLU0010 |
| 11 | C | | | ILLU0011 |
| 12 | C | *****PURPOSE. | | ILLU0012 |
| 13 | C | TO DETERMINE THE TIME INTERVAL FOR THE CURRENT DAY FOR WHICH | | ILLU0013 |
| 14 | C | THE POSITION OF THE CLOUD WIL BE WITHIN THE EARTH'S SHADOW. | | ILLU0014 |
| 15 | C | | | ILLU0015 |
| 16 | C | *****METHOD. | | ILLU0016 |
| 17 | C | THIS SUBROUTINE ASSUMES THAT THE DECLINATION OF THE SUN IS | | ILLU0017 |
| 18 | C | FIXED FOR THE CURRENT DAY, THIS ASSUMPTION WILL HAVE AN ERROR OF | | ILLU0018 |
| 19 | C | LESS THAN 30 SECONDS IN TIME FOR A CLOUD AT LONGITUDE OF 75 | | ILLU0019 |
| 20 | C | DEGREES; THE SUBROUTINE FIRST FINDS THE SUN'S DECLINATION AT | | ILLU0020 |
| 21 | C | ZERO HOURS UNIVERSAL TIME, THEN A CHECK IS MADE TO SEE IF THE | | ILLU0021 |
| 22 | C | CLOUD'S POSITION WILL BE WITHIN THE PRE-DEFINED EARTH SHADOW | | ILLU0022 |
| 23 | C | REGION, IF SO, THEN THE TIME ENTERING AND LEAVING THIS REGION DUE | | ILLU0023 |
| 24 | C | TO THE GEOCENTRIC POSITION OF THE CLOUD IS FOUND, THE CLOUD'S | | ILLU0024 |
| 25 | C | GROWTH AND DRIFT AFTER RELEASE IS USED TO DEFINE THE | | ILLU0025 |
| 26 | C | ILLUMINATION OF THE TOTAL CLOUD. THE RESULT OF THIS SUBROUTINE | | ILLU0026 |
| 27 | C | IS TO DEFINE THE TIME PERIOD(S) FOR POSSIBLE RELEASE WHICH | | ILLU0027 |
| 28 | C | EXCLUDES THE EARTH SHADOW REGION. | | ILLU0028 |
| 29 | C | | | ILLU0029 |
| 30 | C | *****INPUT. | | ILLU0030 |
| 31 | C | | | ILLU0031 |
| 32 | C | MYEAR | -YEAR NUMBER FOR STARTING CALCULATIONS | ILLU0032 |
| 33 | C | | | ILLU0033 |
| 34 | C | I | -CURRENT NUMBER OF DAYS PAST JANUARY 0 OF MYEAR | ILLU0034 |
| 35 | C | | | ILLU0035 |
| 36 | C | PHIP | -GEOCENTRIC LATITUDE OF RELEASE POINT (RADIAN) | ILLU0036 |
| 37 | C | | | ILLU0037 |
| 38 | C | SINCLY | -SINE OF RELEASE POINT'S GEOCENTRIC LATITUDE | ILLU0038 |
| 39 | C | | | ILLU0039 |
| 40 | C | COSCLY | -COSINE OF RELEASE POINT'S GEOCENTRIC LATITUDE | ILLU0040 |
| 41 | C | | | ILLU0041 |
| 42 | C | SHADOW | -RADIUS OF EARTH SHADOW REGION (RADIAN) | ILLU0042 |
| 43 | C | | | ILLU0043 |
| 44 | C | CANHA | -COSINE OF SHADOW | ILLU0044 |
| 45 | C | | | ILLU0045 |
| 46 | C | DRIFT | -THE SPACE-FIXED DRIFT OF CLOUD (DEG/HR) | ILLU0046 |
| 47 | C | | | ILLU0047 |
| 48 | C | GHA | -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS | ILLU0048 |
| 49 | C | | | ILLU0049 |
| 50 | C | | | ILLU0050 |
| 51 | C | ANS11 | -RIGHT ASCENSION OF THE SUN (RADIAN) | ILLU0051 |
| 52 | C | | | ILLU0052 |
| 53 | C | ANS12 | -DECLINATION OF THE SUN (RADIAN) | ILLU0053 |
| 54 | C | | | ILLU0054 |
| 55 | C | RTW | -CONVERSION FACTOR FROM RADIAN TO HOURS | ILLU0055 |
| 56 | C | | | ILLU0056 |
| 57 | C | | | ILLU0057 |
| 58 | C | *****OUTPUT. | | ILLU0058 |
| 59 | C | | | ILLU0059 |
| 60 | C | WINDOW(6,1,1) | -THE DAILY RELEASE WINDOW START/STOP TIMES, | ILLU0060 |
| 61 | C | | | ILLU0061 |
| 62 | C | | -1ST INDEX FOR STORING START/STOP TIMES, | ILLU0062 |
| 63 | C | | -10375 FOR START TIMES | ILLU0063 |
| 64 | C | | -20426 FOR STOP TIMES | ILLU0064 |
| 65 | C | | -2ND INDEX FOR THE CONSTRAINT | ILLU0065 |
| 66 | C | | -1-EARTH SHADOW | ILLU0066 |
| 67 | C | | -3RD INDEX DOWN (NORMALLY STATION NUMBER) | ILLU0067 |
| 68 | C | | | ILLU0068 |
| 69 | C | *****INTERNAL PARAMETERS. | | ILLU0069 |
| 70 | C | | | ILLU0070 |

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|-----|---|---|---|----------|----|
| 71 | C | G1 | -TOTAL SPACE-FIXED ANGULAR DISPLACEMENT DUE TO | ILLU0071 | |
| 72 | C | | -CLOUD DRIET FOR THE EXPERIMENTAL PERIOD, | ILLU0072 | |
| 73 | C | | | ILLU0073 | |
| 74 | C | G2 | -ONE-HALF OF THE SPACE-FIXED ANGULAR DISPLACEMENT | ILLU0074 | |
| 75 | C | | -DUE TO CLOUD GROWTH FOR THE EXPERIMENTAL PERIOD, | ILLU0075 | |
| 76 | C | | | ILLU0076 | |
| 77 | C | X0 | -RIGHT ASCENSION OF EARTH SHADOW CENTER (RADIAN) | ILLU0077 | |
| 78 | C | | | ILLU0078 | |
| 79 | C | Y0 | -DECLINATION OF EARTH SHADOW CENTER (RADIAN) | ILLU0079 | |
| 80 | C | | | ILLU0080 | |
| 81 | C | PHIP2 | -LARGEST VALUE OF CLOUD'S DECLINATION DUE TO | ILLU0081 | |
| 82 | C | | -CLOUD GROWTH (RADIAN) | ILLU0082 | |
| 83 | C | | | ILLU0083 | |
| 84 | C | PHIP3 | -SMALLEST VALUE OF CLOUD'S DECLINATION DUE TO | ILLU0084 | |
| 85 | C | | -CLOUD GROWTH (RADIAN) | ILLU0085 | |
| 86 | C | | | ILLU0086 | |
| 87 | C | ST(3) | -START TIME AS CALCULATED FOR EACH SIDE OF | ILLU0087 | |
| 88 | C | | -TRIANGLE MODEL OF CLOUD'S REGION, | ILLU0088 | |
| 89 | C | | | ILLU0089 | |
| 90 | C | STR(3) | -STOP TIME AS CALCULATED FOR EACH SIDE OF | ILLU0090 | |
| 91 | C | | -TRIANGLE MODEL OF CLOUD'S REGION, | ILLU0091 | |
| 92 | C | | | ILLU0092 | |
| 93 | C | | *****RESTRICTIONS- | ILLU0093 | |
| 94 | C | | ACCURACY OF OUTPUT AS DEFINED ABOVE UNDER 'METHOD'; | ILLU0094 | |
| 95 | C | | | ILLU0095 | |
| 96 | C | | *****SUBPROGRAMS REQUIRED- | ILLU0096 | |
| 97 | C | LIB | | ILLU0097 | |
| 98 | C | RDEPH | | ILLU0098 | |
| 99 | C | | EPHEMERIS TABLES | ILLU0099 | |
| 100 | C | | | ILLU0100 | |
| 101 | C | | *****END OF DOCUMENTATION CARDS***** | ILLU0101 | |
| 102 | C | | | ILLU0102 | |
| 103 | | | SUBROUTINE ILLUM(I) | ILLU0103 | |
| 104 | | | COMMON/BLKX /KMONTH,KDAY ,KYEAR ,LMONTH,LDAY ,LYEAR ,KMO,KDA, | ILLU0104 | |
| 105 | | | 1 KYR, LMO, LDA, LYR, ICALC, IPRT7, IPRT9, IPRT11, IPLOT | ILLU0105 | |
| 106 | | | COMMON/BLK1/SINCLT, COSCLT, SINCLN, COSCLN, RVC | ILLU0106 | |
| 107 | | | COMMON/BLK3/ PHIP,RLANDA | ILLU0107 | |
| 108 | | | COMMON/BLK2/R(8) | ILLU0108 | |
| 109 | | | COMMON/BLK4/DTR, RVD, MTR, HALPR2, RTH, AU, DELTA(4), ERM, BGWA | ILLU0109 | |
| 110 | | | COMMON/BLK5/ SUNL, SHA | ILLU0110 | |
| 111 | | | COMMON/BLK6/ WINDOW(475*12) | ILLU0111 | |
| 112 | | | COMMON/BLK7/SHADOW | ILLU0112 | |
| 113 | | | DOUBLE PRECISION DTR, RVD, MTR, HALPPI | ILLU0113 | |
| 114 | | | DIMENSION Y(10) | ILLU0114 | |
| 115 | | | DIMENSION XNS(12) | ILLU0115 | |
| 116 | | | DIMENSION ST(3), STR(3) | ILLU0116 | |
| 117 | C | | SETUP SUBROUTINE CONSTANTS | ILLU0117 | |
| 118 | | C1 | =R(6) * MTR | ILLU0118 | |
| 119 | | C2 | =R(8) | ILLU0119 | 2 |
| 120 | | C3 | =SQR(C1*C1 + C2*C2) | ILLU0120 | 3 |
| 121 | | PHIP2 | =PHIP + C2 | ILLU0121 | 4 |
| 122 | | PHIP3 | =PHIP - C2 | ILLU0122 | 5 |
| 123 | | UT | =-1.0*RLANDA*RTH | ILLU0123 | 6 |
| 124 | | UT | =AMOD(UT*24,0) | ILLU0124 | 7 |
| 125 | | | IF (UT .LT. 0) UT = UT + 24.0 | ILLU0125 | 8 |
| 126 | C | | FIND RA AND DECL OF SUN FOR LOCAL MIDNIGHT OF RELEASE POINT | ILLU0126 | |
| 127 | | | CALL RDEPH (KYEAR,UT,ANS) | ILLU0127 | 11 |
| 128 | C | | CONVERT RA AND DECL OF SUN TO CENTER OF SHADOW | ILLU0128 | |
| 129 | | X0 | =ANS(1) + 2.0*HALPPI | ILLU0129 | 12 |
| 130 | | Y0 | =-1.0*ANS(2) | ILLU0130 | 13 |
| 131 | C | | INITIALIZE START, STOP TIMES TO 0; AND 24, RESPECTIVELY, | ILLU0131 | |
| 132 | | DO 100 I = 1,8 | | ILLU0132 | 14 |
| 133 | | ST(I) | =0.0 | ILLU0133 | 15 |
| 134 | | 100 ST(I) | =24.0 | ILLU0134 | 16 |
| 135 | | DO 90 I = 1,10 | | ILLU0135 | 18 |
| 136 | | 90 Y(I) | =0.0 | ILLU0136 | 19 |
| 137 | | J | =3 | ILLU0137 | 21 |
| 138 | | IF (PHIP - Y0) 101,102,102 | | ILLU0138 | 22 |
| 139 | | 101 IF (Y0 - PHIP2) 11,102,102 | | ILLU0139 | 23 |
| 140 | | 102 IF (ABS(PHIP2 - Y0),LN,SHADOW) GO TO 21 | | ILLU0140 | 24 |
| 141 | | IF (ABS(PHIP - Y0),GV,SHADOW) GO TO 21 | | ILLU0141 | 27 |
| 142 | C | | FIND TIMES WHEN EARTH SHADOW REGION IS TANGENT TO LINE 1, | ILLU0142 | |
| 143 | | 21 Y11 | =Y0 + E1*SHADOW/CS | ILLU0143 | 30 |
| 144 | | Y12 | =Y0 - C1*SHADOW/CS | ILLU0144 | 31 |

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| 145 | IF ((PHIP-V11),GT,0,) GO TO 12 | ILLU0145 | 1 |
| 146 | IF ((V11-PHIP2),GT,0,) GO TO 12 | ILLU0146 | 35 |
| 147 | B11 = (C1*V1 - C2*V0 + SHADOW*E3)/E1 | ILLU0147 | 36 |
| 148 | V11 = ((C1/E2 + (PHIP-B11) - BLANDR) * RTH - GHA) / DGH | ILLU0148 | 39 |
| 149 | V11 = SHAD*V(1),24,0) | ILLU0149 | 40 |
| 150 | IF (V11)LT,0,) V(1) = V11 & 24,0 | ILLU0150 | 41 |
| 151 | GO TO 13 | ILLU0151 | 44 |
| 152 | 12 CONTINUE | ILLU0152 | 45 |
| 153 | IF (PHIP,GT,V11) CALL LINE (NO,VB,PHIP,0.0,V(J),T(J+1)) | ILLU0153 | 46 |
| 154 | J = J + 2 | ILLU0154 | 49 |
| 155 | IF (PHIP2,LT,V11) CALL LINE (NO,VB,PHIP2,C1 *T(J),T(J+1)) | ILLU0155 | 50 |
| 156 | J = J + 2 | ILLU0156 | 53 |
| 157 | 13 CONTINUE | ILLU0157 | 54 |
| 158 | IF ((PHIP-V12),GT,0,) GO TO 14 | ILLU0158 | 55 |
| 159 | IF ((V12-PHIP2),GT,0,) GO TO 14 | ILLU0159 | 58 |
| 160 | B12 = (C1*V2 - C2*V0 + SHADOW*E3)/E1 | ILLU0160 | 61 |
| 161 | V12 = ((C1/E2 + (PHIP-B12) - BLANDR) * RTH - GHA) / DGH | ILLU0161 | 62 |
| 162 | V12 = SHAD*V(2),24,0) | ILLU0162 | 63 |
| 163 | IF (V12)LT,0,) V(2) = V12 & 24,0 | ILLU0163 | 64 |
| 164 | GO TO 15 | ILLU0164 | 67 |
| 165 | 14 CONTINUE | ILLU0165 | 68 |
| 166 | IF (PHIP,GT,V12) CALL LINE (NO,VB,PHIP,0.0,T(J),T(J+1)) | ILLU0166 | 69 |
| 167 | J = J + 2 | ILLU0167 | 72 |
| 168 | IF (PHIP2,LT,V12) CALL LINE (NO,VB,PHIP2,C1 *T(J),T(J+1)) | ILLU0168 | 73 |
| 169 | 15 DO 200 K=J,2 | ILLU0169 | 76 |
| 170 | IF (V(K),EQ,0,) GO TO 200 | ILLU0170 | 77 |
| 171 | IF (V(K)-V(K+1)) 201,200,203 | ILLU0171 | 80 |
| 172 | 201 STP(1) = SHIN(STP(1),V(K)) | ILLU0172 | 81 |
| 173 | SV(1) = ANAS1(ST(1),V(K+1)) | ILLU0173 | 82 |
| 174 | GO TO 200 | ILLU0174 | 83 |
| 175 | 202 STP(1) = SHIN(STP(1),V(K+1)) | ILLU0175 | 84 |
| 176 | SV(1) = ANAS1(ST(1),V(K)) | ILLU0176 | 85 |
| 177 | 200 CONTINUE | ILLU0177 | 86 |
| 178 | IF (V11),EQ,0,) GO TO 16 | ILLU0178 | 88 |
| 179 | STP(1) = SHIN(STP(1),V(1)) | ILLU0179 | 91 |
| 180 | SV(1) = ANAS1(ST(1),V(1)) | ILLU0180 | 92 |
| 181 | 16 CONTINUE | ILLU0181 | 93 |
| 182 | IF (V12),EQ,0,) GO TO 16 | ILLU0182 | 94 |
| 183 | STP(2) = SHIN(STP(1),V(2)) | ILLU0183 | 97 |
| 184 | SV(2) = ANAS1(ST(1),V(2)) | ILLU0184 | 98 |
| 185 | 21 DO 190 I=1,18 | ILLU0185 | 99 |
| 186 | 190 V(I) = 0.0 | ILLU0186 | 100 |
| 187 | J = 13 | ILLU0187 | 102 |
| 188 | IF (PHIP3-Y0) 103,104,104 | ILLU0188 | 103 |
| 189 | 103 IF (V0-PHIP) 22,104,104 | ILLU0189 | 104 |
| 190 | 104 IF (ABS(PHIP-Y0),LE,SHADOW) GO TO 22 | ILLU0190 | 105 |
| 191 | IF (ABS(PHIP3-Y0),GT,SHADOW) GO TO 21 | ILLU0191 | 106 |
| 192 | C FIND TIMES WHEN EARTH SHADOW REGION IS TANGENT TO LINE 2, | ILLU0192 | |
| 193 | 22 V21 = V0 + C1*SHADOW/E3 | ILLU0193 | 111 |
| 194 | V22 = V0 - C1*SHADOW/E3 | ILLU0194 | 112 |
| 195 | IF ((PHIP3-V21),GT,0,) GO TO 23 | ILLU0195 | 113 |
| 196 | IF ((V21-PHIP) ,GT,0,) GO TO 23 | ILLU0196 | 116 |
| 197 | B21 = (C1*V21 - C2*V0 + SHADOW*E3)/E1 | ILLU0197 | 119 |
| 198 | V11 = ((C1/E2 + (B21-PHIP) - BLANDR) * RTH - GHA) / DGH | ILLU0198 | 120 |
| 199 | V11 = SHAD*V(1),24,0) | ILLU0199 | 121 |
| 200 | IF (V11)LT,0,) V(1) = V11 & 24,0 | ILLU0200 | 122 |
| 201 | GO TO 24 | ILLU0201 | 125 |
| 202 | 23 CONTINUE | ILLU0202 | 126 |
| 203 | IF (PHIP3,GT,V21) CALL LINE (NO,VB,PHIP3,C1 *T(J),T(J+1)) | ILLU0203 | 127 |
| 204 | J = J + 2 | ILLU0204 | 130 |
| 205 | IF (PHIP,LT,V21) CALL LINE (NO,VB,PHIP,0.0,T(J),T(J+1)) | ILLU0205 | 131 |
| 206 | J = J + 2 | ILLU0206 | 134 |
| 207 | 24 CONTINUE | ILLU0207 | 135 |
| 208 | IF ((PHIP3-V22),GT,0,) GO TO 25 | ILLU0208 | 136 |
| 209 | IF ((V22-PHIP) ,GT,0,) GO TO 25 | ILLU0209 | 139 |
| 210 | B22 = (C1*V22 - C2*V0 + SHADOW*E3)/E1 | ILLU0210 | 142 |
| 211 | V12 = ((C1/E2 + (B22-PHIP) - BLANDR) * RTH - GHA) / DGH | ILLU0211 | 143 |
| 212 | V12 = SHAD*V(2),24,0) | ILLU0212 | 144 |
| 213 | IF (V12)LT,0,) V(2) = V12 & 24,0 | ILLU0213 | 145 |
| 214 | GO TO 26 | ILLU0214 | 148 |
| 215 | 25 CONTINUE | ILLU0215 | 149 |
| 216 | IF (PHIP3,GT,V22) CALL LINE (NO,VB,PHIP3,C1 *T(J),T(J+1)) | ILLU0216 | 150 |
| 217 | J = J + 2 | ILLU0217 | 153 |

AND DOES NOT APPEAR IN READ, DATA, COMMON OR LEFT OF EQUALS (=)

67906 01 09-25-72 11,777

EARTH SHADOW CONSTRAINT

*****ROUTINE ILLUM*****

PREFACE

PROGRAM BREAK 2037
COMMON LENGTH 0
V COUNT 0195 5

PRIMARY SYMDEF ENTRY

ILLUM 8

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

| | | |
|----|-------|-----|
| 1 | BLWA | 21 |
| 2 | BLW01 | 9 |
| 3 | BLW03 | 2 |
| 4 | BLW01 | 10 |
| 5 | BLW0 | 20 |
| 6 | BLW0 | 2 |
| 7 | BLW0 | 590 |
| 10 | BLW0 | 1 |

SYMDEF

11 LINE
12 SGRV
13 RDSH

2017 IS THE NEXT AVAILABLE LOCATION.

GNAP VERSION/ASSEMBLY DATES JMDA 050171/052571 JMD8 050171/052571 JMDP 050171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
** 19978 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY?

67906 01 09-25-72 11,790

REPETITIVE EARTH SHADOW CALCULATIONS

*****ROUTINE LIN*****

| | | | |
|----|--------|--|----------|
| 1 | CLINI | REPETITIVE EARTH SHADOW CALCULATIONS | LIN10001 |
| 2 | C***** | SUBROUTINE LIN***** | LIN10002 |
| 3 | C | | LIN10003 |
| 4 | C***** | START OF DOCUMENTATION CARDS***** | LIN10004 |
| 5 | C | | LIN10005 |
| 6 | C***** | NASA WALLOPS VERSION OF 00/01/71 | LIN10006 |
| 7 | C | | LIN10007 |
| 8 | C***** | LANGUAGE-FORTRAN IV | LIN10008 |
| 9 | C | | LIN10009 |
| 10 | C***** | MACHINE-WH625 | LIN10010 |
| 11 | C | | LIN10011 |
| 12 | C***** | PURPOSE. | LIN10012 |
| 13 | C | TO CALCULATE THE POSSIBLE RELEASE TIMES FOR THE CLOUD | LIN10013 |
| 14 | C | ILLUMINATION CONSTRAINT. | LIN10014 |
| 15 | C | | LIN10015 |
| 16 | C***** | METHOD. | LIN10016 |
| 17 | C | THIS SUBROUTINE IS USED TO SOLVE THE POSSIBLE RELEASE TIME | LIN10017 |
| 18 | C | CALCULATIONS AS DEFINED IN SUBROUTINE ILLUM USING AN EQUATION | LIN10018 |
| 19 | C | THAT IS COMMON TO MANY CASES OF THE PROBLEM. THIS ROUTINE IS | LIN10019 |
| 20 | C | USED TO SIMPLIFY THE MANIPULATIONS OF SUBROUTINE ILLUM. | LIN10020 |
| 21 | C | | LIN10021 |
| 22 | C***** | INPUT. | LIN10022 |
| 23 | C | | LIN10023 |
| 24 | C | XD - RIGHT ASCENSION OF EARTH SHADOW CENTER (RADIAN) | LIN10024 |
| 25 | C | | LIN10025 |
| 26 | C | YD - DECLINATION OF EARTH SHADOW CENTER (RADIAN) | LIN10026 |
| 27 | C | | LIN10027 |
| 28 | C | SHADOW - RADIUS OF EARTH SHADOW REGION (RADIAN) | LIN10028 |
| 29 | C | | LIN10029 |
| 30 | C | GHA - GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURSLIN10030 | |

| | | | | |
|----|---|--|---|----------|
| 31 | C | | -UNIVERSAL TIME (HRS) | LIN10031 |
| 32 | C | | | LIN10032 |
| 33 | C | DDHA | -HOURLY CHANGE FOR SIDEREAL TIME | LIN10033 |
| 34 | C | | | LIN10034 |
| 35 | C | RTM | -CONVERSION FACTOR FROM RADIAN TO HOURS | LIN10035 |
| 36 | C | | | LIN10036 |
| 37 | C | RLANDA | -LONGITUDE OF RELEASE POINT (RADIAN) | LIN10037 |
| 38 | C | | | LIN10038 |
| 39 | C | PHI | -DECLINATION OF INTERSECTING POINT FOR CASE IN | LIN10039 |
| 40 | C | | -QUESTION (RADIAN) | LIN10040 |
| 41 | C | | | LIN10041 |
| 42 | C | C | -APPLICABLE CONSTANT FOR CLOUD DRIFT (RAD/HR) | LIN10042 |
| 43 | C | | | LIN10043 |
| 44 | C | | | LIN10044 |
| 45 | C | *****OUTPUT* | | LIN10045 |
| 46 | C | | | LIN10046 |
| 47 | C | T1 | -POSSIBLE TIME OF RELEASE FOR CASE IN QUESTION (HR) | LIN10047 |
| 48 | C | | | LIN10048 |
| 49 | C | T2 | -POSSIBLE TIME OF RELEASE FOR CASE IN QUESTION (HR) | LIN10049 |
| 50 | C | | | LIN10050 |
| 51 | C | *****SUBPROGRAMS REQUIRED- | | LIN10051 |
| 52 | C | NONE | | LIN10052 |
| 53 | C | | | LIN10053 |
| 54 | C | *****RESTRICTIONS- | | LIN10054 |
| 55 | C | NONE KNOWN | | LIN10055 |
| 56 | C | | | LIN10056 |
| 57 | C | *****END OF DOCUMENTATION CARDS***** | | LIN10057 |
| 58 | C | | | LIN10058 |
| 59 | | SUBROUTINE LIN1 (X0,Y0,PHI,C,T1,T2) | | LIN10059 |
| 60 | | COMMON/BLK37 PHIP,RLANDA | | LIN10060 |
| 61 | | COMMON/BLK6 /DTH, RTM, MYR, HALFRT, RTM, AU, DELTA(4), ERM, DGHA | | LIN10061 |
| 62 | | COMMON/BLK6 /SUNL, GHA | | LIN10062 |
| 63 | | COMMON/BLK6 /SHADOW | | LIN10063 |
| 64 | | DOUBLE PRECISION DTH, RTM, MYR, HALFRT | | LIN10064 |
| 65 | | TEMP = SORT(SHADOW=SHADOW*(RM1-Y2)*PHI-Y0)/DTH/DGHA | | LIN10065 |
| 66 | | T2 = ((X0-RLANDA-C)*RTM+GHA)/DTH | | LIN10066 |
| 67 | | T1 = T2 + TEMP | | LIN10067 |
| 68 | | T2 = T2 + TEMP | | LIN10068 |
| 69 | | T1 = AHOD(T1*24,0) | | LIN10069 |
| 70 | | T2 = AHOD(T2*24,0) | | LIN10070 |
| 71 | | IF (T2.LT.0) T2 = T2 + 24.0 | | LIN10071 |
| 72 | | IF (T2.LT.0) T2 = T2 + 24.0 | | LIN10072 |
| 73 | | RETURN | | LIN10073 |
| 74 | | END | | LIN10074 |

23657 WORDS OF MEMORY USED BY THIS COMPILE

67906 01 09-25-72 11,799

REPEITIVE EARTH SHADOW CALCULATIONS

*****ROUTINE LIN1*****

PREFACE

PROGRAM BREAK 166
COMMON LENGTH 0
V COUNT 015 9

PRIMARY SYMDEF ENTRY

LIN1 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

| | | |
|---|------|----|
| 1 | BLK3 | 2 |
| 2 | BLK4 | 20 |
| 3 | BLK6 | 2 |
| 4 | BLK6 | 1 |

SYNREF

3 80RV
 164 TO THE NEXT AVAILABLE LOCATION.
 GHAP VERSION/ASSEMBLY DATES JHPA 090171/052571 JMBB 090171/052571 JHPC 050171/052571
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
 66 19279 WORDS OF MEMORY WERE USED BY GHAP FOR THIS ASSEMBLY

67906 01 09-05-72 11.80E SUBROUTINE RDEPH

| | | | |
|----|-------|--|----------|
| 1 | CRDEP | SUBROUTINE RDEPH | RDEP0001 |
| 2 | C | | RDEP0003 |
| 3 | | SUBROUTINE RDEPH(YEAR, DAY, ET, ANS) | RDEP0002 |
| 4 | C | *****START OF DOCUMENTATION CARDS***** | RDEP0005 |
| 5 | C | | RDEP0006 |
| 6 | C | NASA/HALLOES VERSION OF 01/01/69 | RDEP0007 |
| 7 | C | | RDEP0008 |
| 8 | C | LANGUAGE = FORTRAN IV | RDEP0009 |
| 9 | C | | RDEP0004 |
| 10 | C | MACHINE = GE 625 | RDEP0010 |
| 11 | C | | RDEP0011 |
| 12 | C | PURPOSE | RDEP0012 |
| 13 | C | RDEPH COMPUTES THE SUN AND MOONS' POSITION VECTOR | RDEP0013 |
| 14 | C | | RDEP0014 |
| 15 | C | METHOD | RDEP0015 |
| 16 | C | THIS ROUTINE USES A THIRD DEGREE POLYNOMIAL TO INTERPOLATE | RDEP0016 |
| 17 | C | TO A DESIRED ACCURACY OF APPROXIMATELY 5 ARC SECONDS | RDEP0017 |
| 18 | C | | RDEP0018 |
| 19 | C | RESTRICTIONS | RDEP0019 |
| 20 | C | | RDEP0020 |
| 21 | C | EPHEMERIS DATA IS PRESENTLY AVAILABLE FOR THE YEARS 1972-1980 | RDEP0021 |
| 22 | C | | RDEP0022 |
| 23 | C | CALLING SEQUENCE | RDEP0023 |
| 24 | C | | RDEP0024 |
| 25 | C | CALL RDEPH(YEAR, DAY, ET, ANS) | RDEP0025 |
| 26 | C | | RDEP0026 |
| 27 | C | INPUT | RDEP0027 |
| 28 | C | | RDEP0028 |
| 29 | C | YEAR = THE YEAR NUMBER | RDEP0029 |
| 30 | C | DAY = THE DAY OF YEAR | RDEP0030 |
| 31 | C | ET = THE EPHEMERIS TIME PAST THE EPOCH DATE (HOURS) | RDEP0031 |
| 32 | C | | RDEP0032 |
| 33 | C | OUTPUT | RDEP0033 |
| 34 | C | | RDEP0034 |
| 35 | C | ANS(1) = THE SUN'S RIGHT ASCENSION (RADIAN) | RDEP0035 |
| 36 | C | ANS(2) = THE SUN'S DECLINATION (RADIAN) | RDEP0036 |
| 37 | C | ANS(3) = THE SUN'S RADIUS VECTOR (A.U.) | RDEP0037 |
| 38 | C | | RDEP0038 |
| 39 | C | ANS(4-6) = THE INERTIAL X, Y, Z COORDINATES OF THE SUN (AU) | RDEP0039 |
| 40 | C | | RDEP0040 |
| 41 | C | ANS(7) = THE MOON'S RIGHT ASCENSION (RADIAN) | RDEP0041 |
| 42 | C | ANS(8) = THE MOON'S DECLINATION (RADIAN) | RDEP0042 |
| 43 | C | ANS(9) = THE MOON'S RADIUS VECTOR (EARTH RADIUS) | RDEP0043 |
| 44 | C | | RDEP0044 |
| 45 | C | ANS(10-12) = THE INERTIAL X, Y, Z COORDINATES OF THE MOON (EARTH RADIUS) | RDEP0045 |
| 46 | C | SUBPROGRAMS REQUIRED | RDEP0046 |
| 47 | C | SUBROUTINE TABLE | RDEP0047 |
| 48 | C | | RDEP0048 |
| 49 | C | *****END OF DOCUMENTATION CARDS***** | RDEP0049 |
| 50 | C | | RDEP0050 |
| 51 | | INTEGER YEAR, DAY, X, Y, Z, LAST | RDEP0051 |
| 52 | | DIMENSION NAME(9) | RDEP0052 |
| 53 | | DIMENSION ANS(12), BETAS(24), Y(4), SUM(2), DIF(2) | RDEP0053 |
| 54 | | DOUBLE PRECISION BEVA, X, Y, SUM, DIF | RDEP0054 |
| 55 | | DOUBLE PRECISION PI | RDEP0055 |
| 56 | | COMMON /EPR0K/ Y, I | RDEP0056 |
| 57 | | DATA PI/3.141592653589793238D 01/ | RDEP0057 |
| 58 | | DATA NAME/ 6HYEAR72, 6HYEAR73, 6HYEAR74, 6HYEAR75, 6HYEAR76, 6HYEAR77, | RDEP0058 |
| 59 | 1 | 6HYEAR78, 6HYEAR79, 6HYEAR80, /, LAST/0/, YLAST/0/ | RDEP0059 |
| 60 | C | | RDEP0060 |
| 61 | | YR = YEAR | RDEP0061 |
| 62 | C | ADJUST THE DAY NUMBER | RDEP0062 |

| | | | | |
|-----|---|--|----------|----|
| 63 | C | | RDEP0063 | |
| 64 | | I = E7/24.0 | RDEP0064 | 2 |
| 65 | | I = DAY * I | RDEP0065 | 3 |
| 66 | C | | RDEP0066 | |
| 67 | C | COMPUTE THE CODED VALUE OF X | RDEP0067 | |
| 68 | C | | RDEP0068 | |
| 69 | | TIME = AMOD(ET/24.0) | RDEP0069 | 4 |
| 70 | | X = TIME/12.000 - 1.000 | RDEP0070 | 5 |
| 71 | | 5 IF (I.GT.0.AND.I.LT.566) GO TO 20 | RDEP0071 | 6 |
| 72 | C | | RDEP0072 | |
| 73 | C | COMPUTE THE NUMBER OF DAYS IN THE CURRENT YEAR | RDEP0073 | |
| 74 | C | | RDEP0074 | |
| 75 | | NDPYR = 365 | RDEP0075 | 9 |
| 76 | | IF (MOD(YR,4) .EQ. 0) NDPYR = 366 | RDEP0076 | 10 |
| 77 | | IF (I - NDPYR) 10+28.15 | RDEP0077 | 13 |
| 78 | | 10 YR = YR-1 | RDEP0078 | 14 |
| 79 | | I = I+365 | RDEP0079 | 15 |
| 80 | C | | RDEP0080 | |
| 81 | C | IS THE NEW YEAR OF EPOCH A LEAP YEAR | RDEP0081 | |
| 82 | C | | RDEP0082 | |
| 83 | | IF (MOD(YR,4) .EQ. 0) I = I+1 | RDEP0083 | 16 |
| 84 | | GO TO 5 | RDEP0084 | 19 |
| 85 | | 15 YR = YR+1 | RDEP0085 | 20 |
| 86 | | I = I - NDPYR | RDEP0086 | 21 |
| 87 | | GO TO 5 | RDEP0087 | 22 |
| 88 | | 20 IF (YR.LT.1972.OR.YR.GT.1980) GO TO 200 | RDEP0088 | 23 |
| 89 | C | | RDEP0089 | |
| 90 | C | HAS THE YEAR CHANGED SINCE THE LAST CALL | RDEP0090 | |
| 91 | C | | RDEP0091 | |
| 92 | | IF (YR.EQ.YRLAST) GO TO 25 | RDEP0092 | 26 |
| 93 | | YRLAST = YR | RDEP0093 | 29 |
| 94 | | YR = 1971 | RDEP0094 | 30 |
| 95 | | LNAME = NAME(IYR) | RDEP0095 | 31 |
| 96 | C | | RDEP0096 | |
| 97 | C | LOAD THE LINK FOR THE CORRECT YEAR | RDEP0097 | |
| 98 | C | | RDEP0098 | |
| 99 | | CALL LLINK(LNAME) | RDEP0099 | 32 |
| 100 | | 24 GO TO 30 | RDEP0100 | 33 |
| 101 | C | | RDEP0101 | |
| 102 | C | HAS THE DAY OF YEAR CHANGED SINCE THE LAST ENTRY | RDEP0102 | |
| 103 | C | | RDEP0103 | |
| 104 | | 25 IF (I.EQ.ILAST) GO TO 75 | RDEP0104 | 34 |
| 105 | | 30 ILAST = I | RDEP0105 | 37 |
| 106 | C | | RDEP0106 | |
| 107 | C | INTERPOLATE FOR ALL SIX TABLE ENTRIES | RDEP0107 | |
| 108 | | DO 50 J=1,24,4 | RDEP0108 | 38 |
| 109 | C | SUBROUTINE TABLE = CONTAINS THE EPOCH'S DATA | RDEP0109 | |
| 110 | | CALL TABLE | RDEP0110 | 39 |
| 111 | C | MAKE SURE YIS FOR R,A, ARE NOT MODULAR | RDEP0111 | |
| 112 | | IF (J.EQ.1) GO TO 36 | RDEP0112 | 40 |
| 113 | | IF (J.NE.13) GO TO 35 | RDEP0113 | 43 |
| 114 | | 36 IF (DABS(Y(1)-Y(2))) .GT. PI) Y(2) = Y(2)+2.0*PI | RDEP0114 | 46 |
| 115 | | IF (DABS(Y(2)-Y(3))) .GT. PI) Y(3) = Y(3)+2.0*PI | RDEP0115 | 49 |
| 116 | | IF (DABS(Y(3)-Y(4))) .GT. PI) Y(4) = Y(4)+2.0*PI | RDEP0116 | 52 |
| 117 | | 35 SUM(1) = Y(1)+Y(4) | RDEP0117 | 55 |
| 118 | | SUM(2) = Y(2)+Y(3) | RDEP0118 | 56 |
| 119 | | DIF(1) = Y(4)-Y(1) | RDEP0119 | 57 |
| 120 | | DIF(2) = Y(3)-Y(2) | RDEP0120 | 58 |
| 121 | C | | RDEP0121 | |
| 122 | C | COMPUTE THE COEFFICIENTS FOR A THIRD DEGREE POLYNOMIAL | RDEP0122 | |
| 123 | C | | RDEP0123 | |
| 124 | | BETA(J) = 27.0*SUM(2) = 3.0*SUM(1) | RDEP0124 | 59 |
| 125 | | BETA(J+1) = 27.0*DIF(2) = DIF(1) | RDEP0125 | 60 |
| 126 | | BETA(J+2) = 3.0*(SUM(1)-SUM(2)) | RDEP0126 | 61 |
| 127 | | BETA(J+3) = DIF(1) = 3.0*DIF(2) | RDEP0127 | 62 |
| 128 | | 50 I = I + 369 | RDEP0128 | 63 |
| 129 | C | | RDEP0129 | |
| 130 | C | COMPUTE THE RIGHT ASCENSION AND DECLINATION FOR THE SUN AND MOON | RDEP0130 | |
| 131 | C | | RDEP0131 | |
| 132 | | 75 J = 1 | RDEP0132 | 65 |
| 133 | | DO 80 L=1,2,6 | RDEP0133 | 66 |
| 134 | | M = L+2 | RDEP0134 | 67 |
| 135 | | DO 80 K=L,M | RDEP0135 | 68 |
| 136 | | ANS(K) = (((BETA(J+3)*X+BETA(J+2))*X+BETA(J+1))*X+BETA(J))/6870 | RDEP0136 | 69 |

| | | | |
|-----|--|----------|----|
| 137 | 88 JSD.4 | RDEP0137 | 70 |
| 138 | C | RDEP0138 | |
| 139 | C | RDEP0139 | |
| 140 | C | RDEP0140 | |
| 141 | DO 90 K01.7.6 | RDEP0141 | 73 |
| 142 | RA = ANS(K) | RDEP0142 | 74 |
| 143 | DB = ANS(K21) | RDEP0143 | 75 |
| 144 | R = ANS(K22) | RDEP0144 | 76 |
| 145 | COSRA = COS(RA) | RDEP0145 | 77 |
| 146 | SINRA = SIN(RA) | RDEP0146 | 78 |
| 147 | RCOSDB = RCOS(DB) | RDEP0147 | 79 |
| 148 | ANS(K63) = RCOSDB * COSRA | RDEP0148 | 80 |
| 149 | ANS(K64) = RCOSDB * SINRA | RDEP0149 | 81 |
| 150 | ANS(K65) = R * SIN(DB) | RDEP0150 | 82 |
| 151 | 90 CONTINUE | RDEP0151 | 83 |
| 152 | 100 RETURN | RDEP0152 | 85 |
| 153 | 200 WRITE(6,306) 19 YR | RDEP0153 | 86 |
| 154 | TOP | RDEP0154 | 89 |
| 155 | 300 FORMAT(6H ABNORMAL TERMINATION * EPHMERIS DATA NOT AVAILABLE FOR | RDEP0155 | 90 |
| 156 | 1 THE 14.7H DAY OF 15) | RDEP0156 | |
| 157 | END | RDEP0157 | 90 |

26781 WORDS OF MEMORY USED BY THIS COMPILEATION

67906 01 09-25-72 11,816 SUBROUTINE RDEPH

PREFACE

PROGRAM BREAK 678
COMMON LENGTH 0
V COUNT DITS 5

PRIMARY SYMDEF ENTRY

RDEPH 0

SECONDARY SYMDEF ENTRY

ELDER LENGTH

1 ENRDLK 11

SYNREF

2 COS
3 SIN
4 LLTAK
5 YADLE
6 .FENV.
7 .FEXIT
10 .FPL.
11 .FORD.

673 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JHPA 050172/052571 JMRB 046171/052571 JMPC 050171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
** 19497 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY.

67906 01 09-25-72 11,816 TOTAL SKY BRIGHTNESS MAIN SUBPROGRAM

| | | | |
|---|-------|--|----------|
| 1 | CNLIT | TOTAL SKY BRIGHTNESS MAIN SUBPROGRAM | NLIT0801 |
| 2 | C | | NLIT0802 |
| 3 | C | ***** NIVE LITE ***** | NLIT0803 |
| 4 | C | | NLIT0804 |
| 5 | C | ***** SUMMARY OF DOCUMENTATION ***** | NLIT0805 |
| 6 | C | | NLIT0806 |
| 7 | C | ***** NASA WOLLOPS VERSION OF 02X017X0 ***** | NLIT0807 |

| | | | |
|----|---|--|----------|
| 8 | C | | NLIT0008 |
| 9 | C | *****LANGUAGE=FORTRAN IV | NLIT0009 |
| 10 | C | | NLIT0010 |
| 11 | C | *****MACHINE=GE 625 | NLIT0011 |
| 12 | C | | NLIT0012 |
| 13 | C | *****PURPOSE | NLIT0013 |
| 14 | C | TO DETERMINE FROM DAILY TIME PERIODS, THAT PORTION OF THE STATED | NLIT0014 |
| 15 | C | PERIOD FOR WHICH THE TOTAL SKY BACKGROUND BRIGHTNESS OF THE | NLIT0015 |
| 16 | C | IONIZED BARIUM CLOUD AS SEEN FROM A GIVEN TRACKING STATION WILL | NLIT0016 |
| 17 | C | BE LOWER THAN THE STATED CONSTRAINT, | NLIT0017 |
| 18 | C | | NLIT0018 |
| 19 | C | *****METHOD | NLIT0019 |
| 20 | C | THIS SET OF SUBPROGRAMS DETERMINES THE TOTAL SKY BACKGROUND | NLIT0020 |
| 21 | C | BRIGHTNESS FOR DISCRETE UNIVERSAL TIMES OF THE CURRENT DAY, | NLIT0021 |
| 22 | C | CHECKS ARE MADE EACH TIME THE TOTAL SKY BACKGROUND BRIGHTNESS | NLIT0022 |
| 23 | C | IS CALCULATED TO DETERMINE IF THE GIVEN VALUE OF THIS | NLIT0023 |
| 24 | C | CONSTRAINT HAS BEEN EXCEEDED OR NOT, INTEGER VARIABLES N,M,L ARE | NLIT0024 |
| 25 | C | USED TO RECORD THESE EVENTS, FOR THE EVENT THAT THE CONSTRAINT | NLIT0025 |
| 26 | C | IS EXCEEDED, THE PROPER VARIABLE N,M,L IS GIVEN A VALUE OF ONE, | NLIT0026 |
| 27 | C | IF THE CONSTRAINT IS NOT EXCEEDED THEN THE PROPER INTEGER | NLIT0027 |
| 28 | C | VARIABLE IS SET TO ZERO? | NLIT0028 |
| 29 | C | | NLIT0029 |
| 30 | C | USING THE INI AND MHO INTEGER VARIABLES, SUCCESSIVE POINTS ARE | NLIT0030 |
| 31 | C | CALCULATED IN HALF HOUR TIME INCREMENTS UNTIL A CHANGE OF EVENT | NLIT0031 |
| 32 | C | OCCURS (N NOT EQUAL TO M), THE VNM MAINTAINS THE CODE OF WHAT | NLIT0032 |
| 33 | C | THE CHANGE IN EVENT IS FROM, THE ILY VARIABLE RECORDS THE | NLIT0033 |
| 34 | C | EVENT OR THE CALCULATION PERFORMED AT A TIME BETWEEN THESE OF | NLIT0034 |
| 35 | C | EVENTS VNI AND IHO, THE CALCULATION FOR THE ILY EVENT WHEN | NLIT0035 |
| 36 | C | REPLACES THOSE OF EITHER THE VNI OR IHO EVENT, WHICHEVER IS THE | NLIT0036 |
| 37 | C | SAME AS THE ILY EVENT, THIS PROCESS IS REPEATED UNTIL THE | NLIT0037 |
| 38 | C | ROUTINE CONVERGES TO THE TIME OF EVENT CHANGE WITH AN ACCURACY | NLIT0038 |
| 39 | C | OF .008 HOURS, | NLIT0039 |
| 40 | C | | NLIT0040 |
| 41 | C | THESE TIMES FOUND ARE THEN THE START/STOP RELEASE TIME | NLIT0041 |
| 42 | C | INTERVALS FOR SATISFYING THE TOTAL SKY BRIGHTNESS CONSTRAINT | NLIT0042 |
| 43 | C | FOR A GIVEN STATION ON A GIVEN DAY, | NLIT0043 |
| 44 | C | | NLIT0044 |
| 45 | C | IN ADDITION, IF THE EVENT RECORDED FOR A GIVEN UNIVERSAL TIME IS | NLIT0045 |
| 46 | C | ZERO (A GOOD RELEASE TIME), THE SUBROUTINE TRACK1 CHECKS TO | NLIT0046 |
| 47 | C | MAKE SURE THE CONSTRAINT IS NOT EXCEEDED DURING THE | NLIT0047 |
| 48 | C | EXPERIMENTAL PERIOD, IF THE BRIGHTNESS CONSTRAINT IS EXCEEDED | NLIT0048 |
| 49 | C | DURING THE EXPERIMENTAL PERIOD, THEN THE UNIVERSAL TIME RECORDED | NLIT0049 |
| 50 | C | IS CONSIDERED AS NOT FAVORABLE AND THE EVENT CODE FOR THAT TIME | NLIT0050 |
| 51 | C | IS CHANGED TO ONE, | NLIT0051 |
| 52 | C | | NLIT0052 |
| 53 | C | *****INPUTS | NLIT0053 |
| 54 | C | | NLIT0054 |
| 55 | C | NS -THE NUMBER OF STATIONS USED IN THE PROGRAM | NLIT0055 |
| 56 | C | | NLIT0056 |
| 57 | C | NOB(12) -AN ARRAY CONTAINING THE STATION NUMBERS USED | NLIT0057 |
| 58 | C | | NLIT0058 |
| 59 | C | R(5) -INPUT VALUE FOR TOTAL SKY BACKGROUND BRIGHTNESS | NLIT0059 |
| 60 | C | -(RAYLEIGH) | NLIT0060 |
| 61 | C | | NLIT0061 |
| 62 | C | R(7) -MINIMUM TRACKING PERIOD AFTER RELEASE (HOURS) | NLIT0062 |
| 63 | C | | NLIT0063 |
| 64 | C | BA(12,7) -AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE | NLIT0064 |
| 65 | C | -GIVEN POSITION OF THE CLOUD (RAYLEIGH) | NLIT0065 |
| 66 | C | | NLIT0066 |
| 67 | C | C(22,7) -COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION | NLIT0067 |
| 68 | C | -OF THE TRACKING STATION TO THE CLOUD AND USED TO | NLIT0068 |
| 69 | C | -SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS | NLIT0069 |
| 70 | C | | NLIT0070 |
| 71 | C | ZD -ZODIACAL CLOUD BRIGHTNESS OF A POINT IN THE SKY | NLIT0071 |
| 72 | C | -(RAYLEIGH) | NLIT0072 |
| 73 | C | | NLIT0073 |
| 74 | C | ST -UNRESOLVED STAR BRIGHTNESS OF A POINT IN THE SKY | NLIT0074 |
| 75 | C | -(RAYLEIGH) | NLIT0075 |
| 76 | C | | NLIT0076 |
| 77 | C | | NLIT0077 |
| 78 | C | *****OUTPUT | NLIT0078 |
| 79 | C | | NLIT0079 |
| 80 | C | WINDOW(6,5,12) -THE DAILY RELEASE WINDOW START/STOP TIMES, | NLIT0080 |

| | | | | |
|-----|---|---|----------|----|
| 81 | C | -1ST INDEX FOR STOPPING STASY/STOP TIMES; | NLIT0081 | |
| 82 | C | -1ST INDEX FOR START TIMES | NLIT0082 | |
| 83 | C | -2ND INDEX FOR STOP TIMES | NLIT0083 | |
| 84 | C | -2ND INDEX FOR TIME CONSTRAINT | NLIT0084 | |
| 85 | C | - 5-TOTAL SKY BACKGROUND BRIGHTNESS | NLIT0085 | |
| 86 | C | -3RD INDEX FOR THE STATION NUMBER | NLIT0086 | |
| 87 | C | | NLIT0087 | |
| 88 | C | *****RESTRICTIONS. | NLIT0088 | |
| 89 | C | STOP MUST BE NUMERICALLY GREATER THAN START, ONLY TWELVE | NLIT0089 | |
| 90 | C | STATIONS MAY BE USED, STOP AND START ARE ACCURATE TO ONE | NLIT0090 | |
| 91 | C | HOUR OF TIME. | NLIT0091 | |
| 92 | C | | NLIT0092 | |
| 93 | C | *****SUBPROGRAMS REQUIRED. | NLIT0093 | |
| 94 | C | CEVOI | NLIT0094 | |
| 95 | C | ZODLIT | NLIT0095 | |
| 96 | C | TYPE | NLIT0096 | |
| 97 | C | ZTABLE | NLIT0097 | |
| 98 | C | STRLIT | NLIT0098 | |
| 99 | C | TRACK | NLIT0099 | |
| 100 | C | | NLIT0100 | |
| 101 | C | *****REMARKS. | NLIT0101 | |
| 102 | C | ONLY ELEVEN TRACKING STATIONS CAN BE USED AS INPUT IF ONE OF | NLIT0102 | |
| 103 | C | THESE STATIONS IS AN AIRCRAFT. | NLIT0103 | |
| 104 | C | | NLIT0104 | |
| 105 | C | *****END OF DOCUMENTATION CARDS***** | NLIT0105 | |
| 106 | C | | NLIT0106 | |
| 107 | | SUBROUTINE NLIT | NLIT0107 | |
| 108 | | COMMON/BLK17R(8) | NLIT0108 | |
| 109 | | COMMON/BLK17NS, NOS(12) | NLIT0109 | |
| 110 | | COMMON/BLK17 WINDOW(675,12) | NLIT0110 | |
| 111 | | COMMON/BLK17 PHX(127, NY(12), UZ(22), BA(12,7), C(12,7), JEND | NLIT0111 | |
| 112 | | COMMON/BLK17ZD, S9 | NLIT0112 | |
| 113 | C | | NLIT0113 | |
| 114 | C | BEGIN CALCULATION OF TOTAL BRIGHTNESS FOR EACH STATION | NLIT0114 | |
| 115 | | DO 100 I=1,NS | NLIT0115 | |
| 116 | | I = NOS(I) | NLIT0116 | 2 |
| 117 | C | SET FIRST STORAGE TIME TO ZERO FOR STATION I) | NLIT0117 | |
| 118 | | WINDOW(175,I)=0.0 | NLIT0118 | 3 |
| 119 | C | SET STORAGE FOR TIMES TO 24.0 FOR STATION(I) | NLIT0119 | |
| 120 | | DO 200 K=2,6 | NLIT0120 | 4 |
| 121 | | 200 WINDOW(K,I)=24.0 | NLIT0121 | 5 |
| 122 | | K=1 | NLIT0122 | 7 |
| 123 | | START=0. | NLIT0123 | 8 |
| 124 | | TYPE = 1 | NLIT0124 | 9 |
| 125 | C | FIND INERTIAL COMPONENTS OF VECTOR W | NLIT0125 | |
| 126 | | CALL MCTOI (T1,I) | NLIT0126 | 10 |
| 127 | C | FIND THE BRIGHTNESS DUE TO ZODIACAL LIGHT AND STARLIGHT AT TIME T1 | NLIT0127 | |
| 128 | | CALL ZODLIT (T1) | NLIT0128 | 11 |
| 129 | | CALL STRLIT | NLIT0129 | 12 |
| 130 | C | FIND TOTAL BRIGHTNESS AT TIME T1 | NLIT0130 | |
| 131 | | BY = MAX(1,1) + (ZD-ST) * C(1,1) | NLIT0131 | 13 |
| 132 | C | IF BY LESS THAN RESTR | NLIT0132 | |
| 133 | | IF (BY - R(1)) 24.25*23 | NLIT0133 | 14 |
| 134 | C | NO - THEN SET FLAG=1 | NLIT0134 | |
| 135 | | IF N = 1 | NLIT0135 | 15 |
| 136 | | GO TO 11 | NLIT0136 | 16 |
| 137 | C | YES - THEN SET FLAG=0 AND CHECK FOR BRIGHTNESS DURING THE TRACKING | NLIT0137 | |
| 138 | C | PERIOD, | NLIT0138 | |
| 139 | | IF N = 0 | NLIT0139 | 17 |
| 140 | | IF (JEND,GT,1) CALL TRACK (T1,N,3) | NLIT0140 | 18 |
| 141 | C | CHECK POINT HALF HOUR LATER AND USE SAME LOGIC | NLIT0141 | |
| 142 | | IF T2 = T1 + 0.5 | NLIT0142 | 21 |
| 143 | | CALL MCTOI (T2,I) | NLIT0143 | 22 |
| 144 | | CALL ZODLIT (T2) | NLIT0144 | 23 |
| 145 | | CALL STRLIT | NLIT0145 | 24 |
| 146 | | BY = MAX(1,1) + (ZD-ST) * C(1,1) | NLIT0146 | 25 |
| 147 | | IF (BY - R(1)) 24.25*23 | NLIT0147 | 26 |
| 148 | | IF N = 1 | NLIT0148 | 27 |
| 149 | | GO TO 27 | NLIT0149 | 28 |
| 150 | | IF N = 0 | NLIT0150 | 29 |
| 151 | | IF (JEND,GT,1) CALL TRACK (T2,N,3) | NLIT0151 | 30 |
| 152 | C | IF N=0 | NLIT0152 | |
| 153 | | IF (N=0) 24.25*23 | NLIT0153 | 33 |
| 154 | C | YES - WHEN NO CHANGE IN EVENT DURING 25HOUR-CHECK NEXT TIME INCREMENT | NLIT0154 | |

| | | | | |
|-----|--|-------------------------------|----------|----|
| 155 | 28 Y1 | = Y2 | NLIT0155 | 34 |
| 156 | IF (Y2,LY,24.0) GO TO 11 | | NLIT0156 | 35 |
| 157 | Y3 | = 24.0 | NLIT0157 | 38 |
| 158 | GO TO 38 | | NLIT0158 | 39 |
| 159 | C NO - THE CHANGE OF EVENT OCCURRED-MUST NOW FIND TIME OF CHANGE | | NLIT0159 | |
| 160 | 29 IF (Y2-Y3,LY,0.000) GO TO 35 | | NLIT0160 | 40 |
| 161 | Y3 | = Y2 + 0.34(Y2-Y1) | NLIT0161 | 43 |
| 162 | 32 CALL REY01 (Y3,1) | | NLIT0162 | 44 |
| 163 | CALL ZODLIY (Y3) | | NLIT0163 | 45 |
| 164 | CALL SYRLIT | | NLIT0164 | 46 |
| 165 | BY | = BAY(1,1) + (ZD*SY) + E(1,1) | NLIT0165 | 47 |
| 166 | IF (BY-RTS) 32.31+31 | | NLIT0166 | 48 |
| 167 | 31 L | = 1 | NLIT0167 | 49 |
| 168 | GO TO 33 | | NLIT0168 | 50 |
| 169 | 32 L | = 0 | NLIT0169 | 51 |
| 170 | IF (JEND,GT,1) CALL TRACK (Y3,L,1) | | NLIT0170 | 52 |
| 171 | 33 IF (L-N) 39,34,39 | | NLIT0171 | 55 |
| 172 | C IF YES THEN TIME OF CHANGE IS BETWEEN Y2 AND Y3 | | NLIT0172 | |
| 173 | C IF NO THEN TIME OF CHANGE IS BETWEEN Y2 AND Y3 | | NLIT0173 | |
| 174 | 34 Y2 | = Y3 | NLIT0174 | 56 |
| 175 | GO TO 29 | | NLIT0175 | 57 |
| 176 | 35 Y3 | = Y3 | NLIT0176 | 58 |
| 177 | GO TO 29 | | NLIT0177 | 59 |
| 178 | C IS Y3 LESS THAN YSTOP-IF NOT THEN ENTIRE INTERVAL HAS BEEN CHECKED | | NLIT0178 | |
| 179 | 36 IF (Y3,LY,24.0) GO TO 38 | | NLIT0179 | 60 |
| 180 | Y3 | = 24.0 | NLIT0180 | 63 |
| 181 | 38 IF (N) 41,42,41 | | NLIT0181 | 64 |
| 182 | 31 YSTARV, Y3 | | NLIT0182 | 65 |
| 183 | N | = 0 | NLIT0183 | 66 |
| 184 | GO TO 43 | | NLIT0184 | 67 |
| 185 | C STORE TIME INTERVAL FOR SKY BRIGHTNESS CONSTRAINT | | NLIT0185 | |
| 186 | 42 WINDOW(K15,1)=YSTARV | | NLIT0186 | 68 |
| 187 | WINDOW(K15,1)=Y3 | | NLIT0187 | 69 |
| 188 | K15,2 | | NLIT0188 | 70 |
| 189 | YSTARV, Y3 | | NLIT0189 | 71 |
| 190 | N | = 1 | NLIT0190 | 72 |
| 191 | 43 IF (Y3,LY,24.0) GO TO 11 | | NLIT0191 | 73 |
| 192 | 188 CONTINUE | | NLIT0192 | 76 |
| 193 | RETURN | | NLIT0193 | 78 |
| 194 | END | | NLIT0194 | 79 |

28884 WORDS OF MEMORY USED BY THIS COMPILATION

67906 01 09-25-72 11,822 TOTAL SKY BRIGHTNESS MAIN SUBPROGRAM

PREFACE

PROGRAM BREAK 405
COMMON LENGTH 6
V COUNT DIVS 8

PRIMARY SYMDEF ENTRY

NLIVE 8

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

| | | |
|---|-------|-----|
| 1 | BLMB1 | 18 |
| 2 | BLMB | 15 |
| 3 | BLMB | 558 |
| 4 | BLMB | 315 |
| 5 | BLMB3 | 8 |

SYMDEF

6 GCY01
7 TRACK

10 SYBUT
11 ZODUT
404 IS THE NEXT AVAILABLE LOCATION,
CHAP VERSION/ASSEMBLY DATES JHPA 050171/052571 JMRB 050171/052571 JHPC 050171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
** 19429 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY

07906 01 09-25-72 11,842

| | | | | |
|----|---|---|---|----------|
| 1 | C | CHCVI | | GCT10001 |
| 2 | C | | | GCT10002 |
| 3 | C | *****SUBROUTINE GETOI ***** | | GCT10003 |
| 4 | C | | | GCT10004 |
| 5 | C | *****START OF DOCUMENTATION CARDS***** | | GCT10005 |
| 6 | C | | | GCT10006 |
| 7 | C | *****NASA WALLEPS VERSION OF 02/01/70 | | GCT10007 |
| 8 | C | | | GCT10008 |
| 9 | C | *****LANGUAGE=FORTRAN IV | | GCT10009 |
| 10 | C | | | GCT10010 |
| 11 | C | *****MACHINE=GE 625 | | GCT10011 |
| 12 | C | | | GCT10012 |
| 13 | C | *****PURPOSE***** | | GCT10013 |
| 14 | C | TO CONVERT GEOCENTRIC COORDINATES TO INERTIAL COORDINATES? | | GCT10014 |
| 15 | C | | | GCT10015 |
| 16 | C | *****METHOD***** | | GCT10016 |
| 17 | C | FIRST THE SIN AND COS OF THE GREENWICH MEAN SIDEREAL HOUR ANGLE | | GCT10017 |
| 18 | C | IS CALCULATED FOR THE SPECIFIC TIME IN QUESTION, THESE VALUES | | GCT10018 |
| 19 | C | ARE THEN USED TO CONVERT THE GEOCENTRIC COORDINATES TO INERTIAL | | GCT10019 |
| 20 | C | | | GCT10020 |
| 21 | C | *****INPUT***** | | GCT10021 |
| 22 | C | | | GCT10022 |
| 23 | C | GHA | -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOURS | GCT10023 |
| 24 | C | | -UNIVERSAL TIME (HRS) | GCT10024 |
| 25 | C | | | GCT10025 |
| 26 | C | WX | -GEOCENTRIC X COMPONENT OF INPUT VECTOR | GCT10026 |
| 27 | C | | | GCT10027 |
| 28 | C | WY | -GEOCENTRIC Y COMPONENT OF INPUT VECTOR | GCT10028 |
| 29 | C | | | GCT10029 |
| 30 | C | WZ | -GEOCENTRIC Z COMPONENT OF INPUT VECTOR | GCT10030 |
| 31 | C | | | GCT10031 |
| 32 | C | T | -CURRENT UNIVERSAL TIME (HOURS) | GCT10032 |
| 33 | C | | | GCT10033 |
| 34 | C | I | -TRACKING STATION NUMBER | GCT10034 |
| 35 | C | | | GCT10035 |
| 36 | C | HTR | -CONVERSION FROM HOURS TO RADIAN | GCT10036 |
| 37 | C | | | GCT10037 |
| 38 | C | DGHA | -HOURLY CHANGE FOR SIDEREAL TIME | GCT10038 |
| 39 | C | | | GCT10039 |
| 40 | C | | | GCT10040 |
| 41 | C | *****OUTPUT***** | | GCT10041 |
| 42 | C | | | GCT10042 |
| 43 | C | W1 | -INERTIAL X COMPONENT OF OUTPUT VECTOR | GCT10043 |
| 44 | C | | | GCT10044 |
| 45 | C | W2 | -INERTIAL Y COMPONENT OF OUTPUT VECTOR | GCT10045 |
| 46 | C | | | GCT10046 |
| 47 | C | W3 | -INERTIAL Z COMPONENT OF OUTPUT VECTOR | GCT10047 |
| 48 | C | | | GCT10048 |
| 49 | C | *****RESTRICTIONS***** | | GCT10049 |
| 50 | C | NONE KNOWN | | GCT10050 |
| 51 | C | | | GCT10051 |
| 52 | C | *****SUBPROGRAMS REQUIRED***** | | GCT10052 |
| 53 | C | NONE | | GCT10053 |
| 54 | C | | | GCT10054 |
| 55 | C | *****END OF DOCUMENTATION CARDS***** | | GCT10055 |
| 56 | C | | | GCT10056 |
| 57 | C | SUBROUTINE GETOI(I,J) | | GCT10057 |
| 58 | C | COMMON/BLK1/DTM, RTD, WTR, HALFT, RTM, AU, DELTA(4), ERN, DGHA | | GCT10058 |
| 59 | C | COMMON/BLK2/ SUNL, GHA | | GCT10059 |
| 60 | C | COMMON/BLK3/ WX(12), WY(12), WZ(12), BA(12,7), C(12,7), JEQD | | GCT10060 |
| 61 | C | COMMON/BLK4/ W1, W2, W3 | | GCT10061 |

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62 DOUBLE PRECISION DVR, RVD, MYB, WALFPI
63 SN = SIN((GWA + T*DGWA)*MYB)
64 CS = COS((GWA + T*DGWA)*MYB)
65 W2 = WX(1)*CS - WY(1)*SN
66 W2 = WX(1)*SN + WY(1)*CS
67 W3 = WZ(1)
68 RETURN
69 END

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GCY10062
GCY10063
GCY10064 2
GCY10065 3
GCY10066 4
GCY10067 5
GCY10068 6
GCY10069 7

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28883 WORDS OF MEMORY USED BY THIS COMPILE

67906 01 09-25-72 11,849

PREFACE

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PROGRAM BREAK 72
COMMON LENGTH 5
V COUNT DIVS 5

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PRIMARY SYMDEF ENTRY

GCY01 8

SECONDARY SYMDEF ENTRY

BLK# LENGTH

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1 BLK# 20
2 BLK# 2
3 BLK# 319
4 BLK#1 2

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SYNDEF

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5 CDB
6 SIN

```

72 IS THE NEXT AVAILABLE LOCATION,

SNAP VERSION/ASSEMBLY DATE JMRB 050171/052571 JMRB 050171/052571 JHPC 050171/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

66 19233 WORDS OF MEMORY WERE USED BY SNAP FOR THIS ASSEMBLY,

67906 01 09-25-72 11,848 ZODIACAL LIGHT

***** SUBROUTINE ZODLTY *****

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1 CZODL ZODIACAL LIGHT ZODL0001
2 C***** SUBROUTINE ZODLTY ***** ZODL0002
3 C ZODL0003
4 C*****START OF DOCUMENTATION CARDS***** ZODL0004
5 C ZODL0005
6 C*****NASA WALLOPS VERSION OF 02201/70 ZODL0006
7 C ZODL0007
8 C*****LANGUAGE-FORTRAN IV ZODL0008
9 C ZODL0009
10 C*****MAGNITUDE GE 625 ZODL0010
11 C ZODL0011
12 C***** PURPOSE ***** ZODL0012
13 C TO CALCULATE THE ZODIACAL LIGHT FOR A GIVEN SET OF LOOK ZODL0013
14 C COORDINATES ZODL0014
15 C ZODL0015
16 C*****METHOD***** ZODL0016
17 C FIRST SUBROUTINE IT IS CALLED AND THE INERTIAL COORDINATES ZODL0017
18 C OF THE VECTOR FROM THE STATION TO THE TEST CLOUD ARE CONVERTED ZODL0018
19 C TO AN ECLIPTIC LATITUDE AND LONGITUDE, THE ECLIPTIC LATITUDE ZODL0019
20 C AND LONGITUDE ARE THEN MADE ABSOLUTE VALUES, SUBROUTINE ZVABLE ZODL0020
21 C IS THEN CALLED TO TRANSLATE THESE VALUES INTO ZODIACAL LIGHT ZODL0021
22 C VALUES IN RAYLEIGHS ZODL0022
23 C ZODL0023
24 C*****INPUT***** ZODL0024

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| | | | | |
|----|---|---|--|----------|
| 25 | C | | | ZODL0025 |
| 26 | C | W1 | -INERTIAL X COMPONENT OF VECTOR FROM STATION(1) | ZODL0026 |
| 27 | C | | -TO CLOUD | ZODL0027 |
| 28 | C | | | ZODL0028 |
| 29 | C | W2 | -INERTIAL Y COMPONENT OF VECTOR FROM STATION(1) | ZODL0029 |
| 30 | C | | -TO CLOUD | ZODL0030 |
| 31 | C | | | ZODL0031 |
| 32 | C | W3 | -INERTIAL Z COMPONENT OF VECTOR FROM STATION(1) | ZODL0032 |
| 33 | C | | -TO CLOUD | ZODL0033 |
| 34 | C | | | ZODL0034 |
| 35 | C | | | ZODL0035 |
| 36 | C | ***** OUTPUT * | | ZODL0036 |
| 37 | C | | | ZODL0037 |
| 38 | C | ZD | -ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY | ZODL0038 |
| 39 | C | | -(RAYLENGTH) | ZODL0039 |
| 40 | C | | | ZODL0040 |
| 41 | C | *****RESTRICTIONS* | | ZODL0041 |
| 42 | C | NONE | | ZODL0042 |
| 43 | C | | | ZODL0043 |
| 44 | C | *****SUBPROGRAMS REQUIRED* | | ZODL0044 |
| 45 | C | 1YB | | ZODL0045 |
| 46 | C | 2YABL | | ZODL0046 |
| 47 | C | | | ZODL0047 |
| 48 | C | *****END OF DOCUMENTATION CARDS***** | | ZODL0048 |
| 49 | C | | | ZODL0049 |
| 50 | | SUBROUTINE ZODLIT (Y) | | ZODL0050 |
| 51 | | COMMON/BLKN2/PHIE, OMEGA | | ZODL0051 |
| 52 | C | TRANSFORM INERTIAL RECTANGULAR COMPONENTS OF INPUT VECTOR TO ELLIPTIC | | ZODL0052 |
| 53 | C | COORDINATES | | ZODL0053 |
| 54 | | CALL 1YB | | ZODL0054 |
| 55 | | PUTS GAUS(PHIE) | | ZODL0055 |
| 56 | C | PERFORM TABLE LOOKUP FOR VALUE OF ZODIACAL LIGHT, | | ZODL0056 |
| 57 | | CALL 2YABL (Y) | | ZODL0057 |
| 58 | | RETURN | | ZODL0058 |
| 59 | | END | | ZODL0059 |

25762 WORDS OF MEMORY USED BY THIS COMPILE

67906 01 09-25-72 11,892 ZODIACAL LIGHT

***** SUBROUTINE ZODLIT *****

PREPAGE

PROGRAM BREAK 26
COMMON LENGTH 8
V COUNT 8

PRIMARY SYNDX ENTRY

ZODLIT 8

SECONDARY SYNDX ENTRY

BLKX LENGTH

1 BLKN2 8

SUNREF

2 1YB

3 2YABL

26 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JHPC 050171/052971 JHPC 050171/052971 JHPC 050171/052971
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
** 19168 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY.

67086 01 09-25-72 11,856 INERTIAL TO ECLIPTIC TRANSFORMATION

***** SUBROUTINE IYE *****

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1      C:ITWO      INERTIAL TO ECLIPTIC TRANSFORMATION      IYE00801
2      C***** SUBROUTINE IYE ***** IYE00802
3      C      IYE00803
4      C***** START OF DOCUMENTATION CARDS ***** IYE00804
5      C      IYE00805
6      C***** NASA WALLDPS VERSION OF 02101470 IYE00806
7      C      IYE00807
8      C***** LANGUAGE: FORTRAN IV IYE00808
9      C      IYE00809
10     C***** MACHINE: GE 625 IYE00810
11     C      IYE00811
12     C***** PURPOSE: IYE00812
13     C      TO TRANSFORM FROM AN INERTIAL RECTANGULAR COORDINATE SYSTEM AS IYE00813
14     C      DESCRIBED IN USER DOCUMENTATION AND TO FIND THE IYE00814
15     C      ECLIPTIC LATITUDE AND LONGITUDE OF A POINT OF INTERSECTION OF IYE00815
16     C      AN INPUT VECTOR WITH A CELESTIAL SPHERE, IYE00816
17     C      IYE00817
18     C***** METHOD: IYE00818
19     C      ROTATION IS PERFORMED ON THE INERTIAL X,Y,Z COMPONENTS TO GIVE IYE00819
20     C      ECLIPTIC X,Y,Z VALUES. THESE VALUES ARE USED TO CALCULATE THE IYE00820
21     C      ECLIPTIC LATITUDE AND LONGITUDE, IYE00821
22     C      IYE00822
23     C***** INPUT: IYE00823
24     C      IYE00824
25     C      W1      -INERTIAL X COMPONENT OF VECTOR FROM STATION(1) IYE00825
26     C      -TO CLOUD IYE00826
27     C      IYE00827
28     C      W2      -INERTIAL Y COMPONENT OF VECTOR FROM STATION(1) IYE00828
29     C      -TO CLOUD IYE00829
30     C      IYE00830
31     C      W3      -INERTIAL Z COMPONENT OF VECTOR FROM STATION(1) IYE00831
32     C      -TO CLOUD IYE00832
33     C      IYE00833
34     C      IYE00834
35     C***** OUTPUT: IYE00835
36     C      IYE00836
37     C      PHIE      -ECLIPTIC LATITUDE (DEG) IYE00837
38     C      IYE00838
39     C      OMEGA      -ECLIPTIC LONGITUDE (DEG) IYE00839
40     C      IYE00840
41     C      IYE00841
42     C***** INTERNAL PARAMETERS: IYE00842
43     C      IYE00843
44     C      XE      -X COMPONENT OF INPUT VECTOR IN ECLIPTIC IYE00844
45     C      COORDINATES IYE00845
46     C      IYE00846
47     C      YE      -Y COMPONENT OF INPUT VECTOR IN ECLIPTIC IYE00847
48     C      COORDINATES IYE00848
49     C      IYE00849
50     C      ZE      -Z COMPONENT OF INPUT VECTOR IN ECLIPTIC IYE00850
51     C      COORDINATES IYE00851
52     C      IYE00852
53     C***** RESTRICTIONS: IYE00853
54     C      NONE KNOWN IYE00854
55     C      IYE00855
56     C***** SUBPROGRAMS REQUIRED: IYE00856
57     C      NONE IYE00857
58     C      IYE00858
59     C***** END OF DOCUMENTATION CARDS ***** IYE00859
60     C      IYE00860
61     SUBROUTINE IYE IYE00861
62     COMMON/BLKN1/W1, W2, W3 IYE00862
63     COMMON/BLKN2/PHIE, OMEGA IYE00863
64     C PERFORM TRANSFORMATION IYE00864
65     XE = W1 IYE00865
66     YE = 0.91748*W2+0.39779*W3 IYE00866
67     ZE = 0.9039779*W2+0.491748*W3 IYE00867
68     C INSURE XE,YE,ZE ARE COMPONENTS OF A UNIT VECTOR IYE00868
69     RS = 1.0/ SQRT(XE**2 + YE**2 + ZE**2) IYE00869

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| | | | | |
|----|----|---|----------|----|
| 70 | XE | 0X00RE | ITE00070 | 5 |
| 71 | YE | 0Y00RE | ITE00071 | 6 |
| 72 | ZE | 0Z00RE | ITE00072 | 7 |
| 73 | C | FIND BNIN,OMEGAE | ITE00073 | |
| 74 | | PUTE 0AVAN(2E/50R1(117-2E+2B))057'295779513 | ITE00074 | 8 |
| 75 | | OMEGAB,AVAN2(YE,XB)057'295779513 | ITE00075 | 9 |
| 76 | 00 | CONTINUE | ITE00076 | 10 |
| 77 | | RETURN | ITE00077 | 11 |
| 78 | | END | ITE00078 | 12 |

23591 WORDS OF MEMORY USED BY THIS COMPILATION

67906 01 09-25-72 11,868 INTERVAL TO ECLIPYIC TRANSFORMATION

***** SUBROUTINE IVE *****

PREPARE

| | |
|---------------|-----|
| PROGRAM BREAK | 109 |
| COMMON LENGTH | 0 |
| Y COUNT 0195 | 9 |

PRIMARY SYNDOP ENTRY

IVE 0

SECONDARY SYNDOP ENTRY

| | |
|-------|--------|
| BLOCK | LENGTH |
|-------|--------|

| | | |
|---|-------|---|
| 1 | BLKN1 | 3 |
| 2 | BLKN2 | 2 |

SYNREF

| | |
|---|-------|
| 3 | AYBN |
| 4 | SQBY |
| 5 | AYBN2 |

135 TO THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JHFA 050172/052571 JHBB 050171/052571 JHPC 050172/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

00 19219 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY

67906 01 09-25-72 11,935 TABLE OF ZODIACAL LIGHT

***** SUBROUTINE ZTABLE *****

| | | | |
|----|---|---|----------|
| 1 | CZTAB | TABLE OF ZODIACAL LIGHT | ZTAB0001 |
| 2 | C***** SUBROUTINE ZTABLE ***** | | ZTAB0002 |
| 3 | C | | ZTAB0003 |
| 4 | C***** SUMMARY OF DOCUMENTATION CARDS ***** | | ZTAB0004 |
| 5 | C | | ZTAB0005 |
| 6 | C***** NASA WALLOPS VERSION OF 02X01/70 | | ZTAB0006 |
| 7 | C | | ZTAB0007 |
| 8 | C***** LANGUAGE FORTRAN IV | | ZTAB0008 |
| 9 | C | | ZTAB0009 |
| 10 | C***** MACHINE-GE 625 | | ZTAB0010 |
| 11 | C | | ZTAB0011 |
| 12 | C***** PURPOSE | | ZTAB0012 |
| 13 | C | TO FIND THE ZODIACAL LIGHT BRIGHNESS AT A PARTICULAR POINT, | ZTAB0013 |
| 14 | C | | ZTAB0014 |
| 15 | C***** METHOD | | ZTAB0015 |
| 16 | C | THIS IS A TABLE LOOKUP WITH DOUBLE INTERPOLATION, | ZTAB0016 |
| 17 | C | | ZTAB0017 |
| 18 | C***** INPUT | | ZTAB0018 |
| 19 | C | | ZTAB0019 |
| 20 | C | PHIE -ECLIPYIC LATITUDE (DEG) | ZTAB0020 |
| 21 | C | | ZTAB0021 |
| 22 | C | OMEGAB -ECLIPYIC LONGITUDE (DEG) | ZTAB0022 |
| 23 | C | | ZTAB0023 |

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24      C
25      C***** OUTPUT*****
26      C
27      C      ZD      -ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY
28      C      - (RAYLIGHTS)
29      C
30      C
31      C***** INTERNAL PARAMETERS*****
32      C
33      C      P1      -ECLIPYIC LATITUDE FOR BRIGHTNESS AT POINT #1
34      C
35      C      P2      -ECLIPYIC LATITUDE FOR BRIGHTNESS AT POINT #1.1
36      C
37      C      Q1      -ECLIPYIC LONG, FOR BRIGHTNESS AT POINT #1
38      C
39      C      Q2      -ECLIPYIC LONG, FOR BRIGHTNESS AT POINT #1.1
40      C
41      C      ZD1      -VALUE OF ZODIACAL LIGHT AT (P1,Q1)
42      C
43      C      ZD2      -VALUE OF ZODIACAL LIGHT AT (P2,Q2)
44      C
45      C***** RESTRICTIONS*****
46      C      NONE KNOWN
47      C
48      C***** SUBPROGRAMS REQUIRED*****
49      C      NONE
50      C
51      C***** END OF DOCUMENTATION CARDS*****
52      C
53      SUBROUTINE ZTABLE (P)
54      COMMON/BLK0/ SUNL, ONA
55      COMMON/BLK2/PWIE, OMEGA
56      COMMON/BLK3/ZD, ST
57      DIMENSION ZODIAC(10,19)
58      C DEFINE ZODIACAL LIGHT TABLE
59      DATA(ZODIAC(1,J),J=1,19)/ 38807., 38007., 1566., 1200., 9507.,
60      1 788., 835., 310., 250., 200., 1807., 169., 145., 1367.,
61      2 333., 138., 146., 160., 1807.,
62      DATA(ZODIAC(2,J),J=1,19)/ 14807., 12007., 1066., 966., 7807.,
63      1 488., 356., 270., 220., 1857., 1657., 149., 135., 1287.,
64      2 126., 136., 136., 143., 1467.,
65      DATA(ZODIAC(3,J),J=1,19)/ 8087., 7007., 610., 508., 3707.,
66      1 388., 256., 200., 195., 1557., 1427., 129., 122., 1287.,
67      2 117., 126., 124., 107., 1307.,
68      DATA(ZODIAC(4,J),J=1,19)/ 4807., 4007., 388., 308., 2407.,
69      1 279., 188., 160., 144., 1337., 1207., 112., 108., 1067.,
70      2 103., 103., 104., 108., 1007.,
71      DATA(ZODIAC(5,J),J=1,19)/ 2787., 2507., 220., 198., 1757.,
72      1 255., 145., 130., 128., 1087., 1087., 99., 98., 977.,
73      2 95., 94., 93., 93., 957.,
74      DATA(ZODIAC(6,J),J=1,19)/ 1887., 1707., 168., 158., 1357.,
75      1 123., 112., 101., 97., 947., 937., 90., 89., 887.,
76      2 87., 87., 87., 86., 857.,
77      DATA(ZODIAC(7,J),J=1,19)/ 1387., 1317., 125., 117., 1077.,
78      1 98., 93., 90., 86., 847., 837., 80., 82., 827.,
79      2 81., 81., 80., 79., 787.,
80      DATA(ZODIAC(8,J),J=1,19)/ 1087., 1017., 99., 96., 907.,
81      1 83., 80., 78., 787., 747., 737., 73., 73., 747.,
82      DATA(ZODIAC(9,J),J=1,19)/ 887., 797., 78., 77., 747.,
83      13973., 9873., 8873.,
84      DATA(ZODIAC(10,J),J=1,19)/ 194707.,
85      C FIND GEOMETRIC ELONGATION
86      GA = 180-OMEGA-ONAL -0.0418883-7/
87      IF (GA,0Y,888.) GAOA=888.
88      IF (GA,0Y,360.) GO TO 12
89      IF (GA,0Y,180.) GAOB=888.-GA
90      C FIND K AND J
91      K = 0.25PWIE +1.0
92      P1 = 10*(K-1)
93      P2 = P1+10.
94      J = 10.14QA +1.0
95      Q1 = 100*(J-1)
96      Q2 = Q1+10.

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ZYAB0024
 ZYAB0025
 ZYAB0026
 ZYAB0027
 ZYAB0028
 ZYAB0029
 ZYAB0030
 ZYAB0031
 ZYAB0032
 ZYAB0033
 ZYAB0034
 ZYAB0035
 ZYAB0036
 ZYAB0037
 ZYAB0038
 ZYAB0039
 ZYAB0040
 ZYAB0041
 ZYAB0042
 ZYAB0043
 ZYAB0044
 ZYAB0045
 ZYAB0046
 ZYAB0047
 ZYAB0048
 ZYAB0049
 ZYAB0050
 ZYAB0051
 ZYAB0052
 ZYAB0053
 ZYAB0054
 ZYAB0055
 ZYAB0056
 ZYAB0057
 ZYAB0058
 ZYAB0059
 ZYAB0060
 ZYAB0061
 ZYAB0062
 ZYAB0063
 ZYAB0064
 ZYAB0065
 ZYAB0066
 ZYAB0067
 ZYAB0068
 ZYAB0069
 ZYAB0070
 ZYAB0071
 ZYAB0072
 ZYAB0073
 ZYAB0074
 ZYAB0075
 ZYAB0076
 ZYAB0077
 ZYAB0078
 ZYAB0079
 ZYAB0080
 ZYAB0081
 ZYAB0082
 ZYAB0083
 ZYAB0084
 ZYAB0085
 ZYAB0086
 ZYAB0087
 ZYAB0088
 ZYAB0089
 ZYAB0090
 ZYAB0091
 ZYAB0092
 ZYAB0093
 ZYAB0094
 ZYAB0095
 ZYAB0096

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 12
 13
 14
 15
 16

| | | | |
|-----|---|----------|----|
| 97 | C INTERPOLATE TO FIND BRIGHTNESS AT POINT (P1,QA) | ZTAB0097 | |
| 98 | ZD1 = ZODIAB(K,J+1) - (ZODIAB(K,J+1) - ZODIAB(K,J)) * (Q2-QA) / (Q2-Q1) | ZTAB0098 | 17 |
| 99 | C INTERPOLATE TO FIND BRIGHTNESS AT POINT (P2,QA) | ZTAB0099 | |
| 100 | ZD2 = ZODIAB(K+1,J+1) - (ZODIAB(K+1,J+1) - ZODIAB(K+1,J)) * (Q2-QA) / (Q2-Q1) | ZTAB0100 | 18 |
| 101 | 1 | ZTAB0101 | |
| 102 | C INTERPOLATE TO FIND BRIGHTNESS AT POINT (PHIE,QA) | ZTAB0102 | |
| 103 | ZD = ZD2 - (ZD2 - ZD1) * (P2 - PHIE) / (P2 - P1) | ZTAB0103 | 19 |
| 104 | C CALCULATE BRIGHTNESS FOR WAVELENGTH=WAVE | ZTAB0104 | |
| 105 | ZD = ZD010039 | ZTAB0105 | 20 |
| 106 | RETURN | ZTAB0106 | 21 |
| 107 | END | ZTAB0107 | 22 |

23785 WORDS OF MEMORY USED BY THIS COMPIATION

67906 01 0V-85-72 11,948 TABLE OF ZODIACAL LIGHT

***** SUBROUTINE ZYABLE *****

PREFACE

PROGRAM BREAK 517
COMMON LENGTH 0
V COUNT DIVS 5

PRIMARY SYNDX ENTRY

ZYABLE 0

SECONDARY SYNDX ENTRY

BLOCK LENGTH

1 BLK1 2
2 BLK2 2
3 BLK3 2

SYNREF

517 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JHPC 050171/052571 JHPC 050171/052571 JHPC 050171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
68 19255 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY.


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1 COTBL TABLE OF UNRESOLVED STARLIGHT STRL0001
2 C***** SUBROUTINE STRLIT ***** STRL0002
3 C STRL0003
4 C***** START OF DOCUMENTATION CARDS***** STRL0004
5 C STRL0005
6 C***** NASK VALLOPS VERSION OF B2Y01/7X0 STRL0006
7 C STRL0007
8 C***** LANGUAGE-FORTRAN IV STRL0008
9 C STRL0009
10 C***** MAGNITUDE GE 625 STRL0010
11 C STRL0011
12 C***** PURPOSE. STRL0012
13 C TO CALCULATE THE STAR LIGHT BRIGHTNESS AT A GIVEN SET OF LOOK STRL0013
14 C COORDINATES. STRL0014
15 C STRL0015
16 C***** METHOD- STRL0016
17 C A TABLE LOOKUP PROCESS WITH LINEAR INTERPOLATION IS USED TO STRL0017
18 C DETERMINE THE VALUE OF THE STAR BRIGHTNESS OF THE SKY STRL0018
19 C BACKGROUND OF THE CLOUD IS SEEN FROM A GIVEN TRACKING STATION, STRL0019
20 C THE TABLE OF STAR BRIGHTNESS VALUES HAVE BEEN TRANSFORMED INTO STRL0020
21 C INERTIAL COORDINATES WITH UNITS OF TENTH VISUAL STAR MAGNITUDES STRL0021
22 C PER SQUARE DEGREE; BRIGHTNESS VALUES ARE GIVEN IN 5-DEGREE STRL0022
23 C INCREMENTS OF LATITUDE FROM -10 DEG. TO +90 DEG. AND IN 20-DEG. STRL0023
24 C INCREMENTS OF LONGITUDE FROM 0 TO 360 DEGREES. STRL0024
25 C LOOK ANGLES ARE FOUND FROM THE INERTIAL RECTANGULAR COMPONENTS STRL0025
26 C THEN TABLE LINEAR INTERPOLATION DETERMINES THE STAR BRIGHTNESS STRL0026
27 C STRL0027
28 C***** INPUT- STRL0028
29 C STRL0029
30 C W1 -INERTIAL X COMPONENT OF VECTOR FROM STATION(1) STRL0030
31 C -TO CLOUD STRL0031
32 C STRL0032
33 C W2 -INERTIAL Y COMPONENT OF VECTOR FROM STATION(1) STRL0033
34 C -TO CLOUD STRL0034
35 C STRL0035
36 C W3 -INERTIAL Z COMPONENT OF VECTOR FROM STATION(1) STRL0036
37 C -TO CLOUD STRL0037
38 C STRL0038
39 C STRL0039
40 C***** OUTPUT- STRL0040
41 C STRL0041
42 C SY -UNRESOLVED STARLIGHT BRIGHTNESS OF A POINT IN STRL0042
43 C -THE SKY (RAYLEIGH) STRL0043
44 C STRL0044
45 C***** RESTRICTIONS- STRL0045
46 C FORTRAN MEMORY LIMITS MUST BE INCREASED TO 30K FOR COMPILING STRL0046
47 C THIS SUBROUTINE STRL0047
48 C STRL0048
49 C***** SUBPROGRAMS REQUIRED- STRL0049
50 C NONE STRL0050
51 C STRL0051
52 C***** END OF DOCUMENTATION CARDS***** STRL0052
53 C STRL0053
54 SUBROUTINE STRLIT STRL0054
55 COMMON/BLOCK/DTR, RVD, MYR, WALPPI, RTH, AU, DELTA(4), ERH, DGRA STRL0055
56 COMMON/BLOCK/W1, W2, W3 STRL0056
57 COMMON/BLOCK/ZD, SY STRL0057
58 DOUBLE PRECISION DTR, RVD, MYR, WALPPI STRL0058
59 DIMENSION STAR(73,37) STRL0059
60 C DEFINE TABLE OF STAR BRIGHTNESS IN INERTIAL COORDINATE SYSTEM IN TENTH STRL0060
61 C VISUAL STAR MAGNITUDES PER SQUARE DEGREE, EACH DATA STATEMENT DEFINES STRL0061
62 C THE TABLE IN LONGITUDE INCREMENTS PER EACH LATITUDE STRL0062
63 DATA (STAR(K,1), K=1:73) / 2346610/ STRL0063
64 DATA (STAR(K,2), K=1:73) / STRL0064
65 1 60., 60., 60?, 60? , 60? , 60? , 60., 60., 60., 61., STRL0065
66 2 61., 61., 62?, 62? , 62? , 62? , 64., 64., 64., 65., STRL0066
67 3 65., 65., 66?, 66? , 66? , 66? , 68., 68., 68., 69., STRL0067
68 4 69., 69., 70?, 70? , 70? , 70? , 72., 72., 72., 73., STRL0068

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| | | | | | | | | | | | | |
|-----|------|-------------|--------|-------|-------|------|-------|-------|-----|-----|-----|----------|
| 69 | 5 | 77 | 77 | 977 | 767 | 787 | 757 | 747 | 73 | 73 | 72 | STRL0069 |
| 70 | 6 | 71 | 70 | 997 | 887 | 867 | 877 | 887 | 84 | 86 | 85 | STRL0070 |
| 71 | 7 | 69 | 65 | 947 | 847 | 807 | 837 | 827 | 82 | 81 | 81 | STRL0071 |
| 72 | 8 | 61 | 60 | 907 | | | | | | | | STRL0072 |
| 73 | DATA | ISYAR(K,3) | K08,73 | / | | | | | | | | STRL0073 |
| 74 | 1 | 58 | 58 | 957 | 957 | 957 | 947 | 94 | 54 | 54 | 55 | STRL0074 |
| 75 | 2 | 58 | 56 | 977 | 977 | 977 | 907 | 927 | 63 | 64 | 64 | STRL0075 |
| 76 | 3 | 68 | 67 | 987 | 9707 | 9757 | 9787 | 9787 | 81 | 84 | 88 | STRL0076 |
| 77 | 4 | 91 | 95 | 987 | 1017 | 1007 | 1067 | 1087 | 110 | 110 | 110 | STRL0077 |
| 78 | 5 | 110 | 109 | 1077 | 1097 | 1087 | 997 | 987 | 92 | 89 | 85 | STRL0078 |
| 79 | 6 | 82 | 79 | 967 | 937 | 977 | 987 | 987 | 67 | 68 | 66 | STRL0079 |
| 80 | 7 | 68 | 64 | 927 | 917 | 967 | 987 | 997 | 59 | 58 | 57 | STRL0080 |
| 81 | 8 | 57 | 56 | 987 | | | | | | | | STRL0081 |
| 82 | DATA | ISYAR(K,4) | K08,73 | / | | | | | | | | STRL0082 |
| 83 | 1 | 58 | 52 | 917 | 957 | 987 | 907 | 977 | 49 | 50 | 58 | STRL0083 |
| 84 | 2 | 51 | 51 | 927 | 947 | 977 | 977 | 977 | 62 | 64 | 65 | STRL0084 |
| 85 | 3 | 66 | 69 | 927 | 9767 | 987 | 987 | 957 | 103 | 113 | 120 | STRL0085 |
| 86 | 4 | 127 | 135 | 1007 | 9147 | 1407 | 9127 | 1157 | 126 | 150 | 158 | STRL0086 |
| 87 | 5 | 150 | 157 | 1057 | 9137 | 1477 | 9147 | 1107 | 131 | 123 | 114 | STRL0087 |
| 88 | 6 | 109 | 96 | 987 | 987 | 977 | 977 | 977 | 69 | 68 | 67 | STRL0088 |
| 89 | 7 | 88 | 84 | 927 | 917 | 987 | 997 | 997 | 58 | 57 | 56 | STRL0089 |
| 90 | 8 | 58 | 54 | 937 | | | | | | | | STRL0090 |
| 91 | DATA | ISYAR(K,5) | K08,73 | / | | | | | | | | STRL0091 |
| 92 | 1 | 58 | 49 | 987 | 947 | 987 | 947 | 957 | 45 | 45 | 46 | STRL0092 |
| 93 | 2 | 47 | 48 | 997 | 917 | 987 | 957 | 987 | 61 | 69 | 66 | STRL0093 |
| 94 | 3 | 69 | 73 | 997 | 987 | 987 | 9127 | 1287 | 141 | 154 | 165 | STRL0094 |
| 95 | 4 | 178 | 188 | 9207 | 9207 | 9277 | 9227 | 9287 | 240 | 243 | 244 | STRL0095 |
| 96 | 5 | 242 | 237 | 9217 | 9227 | 9207 | 9207 | 1987 | 185 | 173 | 161 | STRL0096 |
| 97 | 6 | 148 | 129 | 9187 | 997 | 987 | 987 | 957 | 72 | 78 | 69 | STRL0097 |
| 98 | 7 | 67 | 65 | 937 | 967 | 987 | 987 | 987 | 97 | 55 | 54 | STRL0098 |
| 99 | 8 | 58 | 51 | 987 | | | | | | | | STRL0099 |
| 100 | DATA | ISYAR(K,6) | K08,73 | / | | | | | | | | STRL0100 |
| 101 | 1 | 47 | 48 | 987 | 947 | 987 | 927 | 927 | 42 | 42 | 43 | STRL0101 |
| 102 | 2 | 44 | 45 | 977 | 997 | 987 | 987 | 987 | 62 | 67 | 68 | STRL0102 |
| 103 | 3 | 72 | 79 | 917 | 9107 | 9127 | 9197 | 11787 | 193 | 217 | 239 | STRL0103 |
| 104 | 4 | 261 | 292 | 9327 | 9377 | 9407 | 9497 | 9527 | 936 | 937 | 929 | STRL0104 |
| 105 | 5 | 513 | 487 | 9417 | 9457 | 9387 | 9327 | 9297 | 272 | 250 | 226 | STRL0105 |
| 106 | 6 | 204 | 181 | 9157 | 9107 | 9107 | 927 | 927 | 76 | 74 | 72 | STRL0106 |
| 107 | 7 | 68 | 66 | 947 | 967 | 987 | 987 | 987 | 85 | 88 | 81 | STRL0107 |
| 108 | 8 | 58 | 48 | 977 | | | | | | | | STRL0108 |
| 109 | DATA | ISYAR(K,7) | K08,73 | / | | | | | | | | STRL0109 |
| 110 | 1 | 44 | 43 | 927 | 947 | 987 | 987 | 987 | 39 | 48 | 41 | STRL0110 |
| 111 | 2 | 42 | 43 | 967 | 987 | 987 | 957 | 957 | 64 | 69 | 72 | STRL0111 |
| 112 | 3 | 78 | 91 | 9107 | 91407 | 9177 | 9207 | 9247 | 276 | 318 | 386 | STRL0112 |
| 113 | 4 | 914 | 636 | 9097 | 97037 | 9687 | 96487 | 9687 | 578 | 557 | 547 | STRL0113 |
| 114 | 5 | 547 | 552 | 9587 | 95807 | 9587 | 95637 | 9527 | 438 | 366 | 323 | STRL0114 |
| 115 | 6 | 287 | 250 | 9207 | 9177 | 9107 | 9127 | 9107 | 83 | 78 | 76 | STRL0115 |
| 116 | 7 | 71 | 67 | 997 | 967 | 987 | 987 | 987 | 53 | 51 | 49 | STRL0116 |
| 117 | 8 | 47 | 45 | 947 | | | | | | | | STRL0117 |
| 118 | DATA | ISYAR(K,8) | K08,73 | / | | | | | | | | STRL0118 |
| 119 | 1 | 41 | 40 | 997 | 9387 | 9387 | 9387 | 9387 | 38 | 38 | 39 | STRL0119 |
| 120 | 2 | 40 | 42 | 947 | 9487 | 9587 | 957 | 987 | 66 | 72 | 77 | STRL0120 |
| 121 | 3 | 88 | 109 | 9187 | 91867 | 9237 | 92817 | 9307 | 413 | 599 | 739 | STRL0121 |
| 122 | 4 | 742 | 673 | 9947 | 94737 | 9397 | 93647 | 93417 | 328 | 321 | 320 | STRL0122 |
| 123 | 5 | 828 | 829 | 9807 | 93017 | 9417 | 9487 | 9487 | 988 | 981 | 966 | STRL0123 |
| 124 | 6 | 588 | 835 | 9287 | 92887 | 9197 | 91467 | 9137 | 94 | 89 | 81 | STRL0124 |
| 125 | 7 | 78 | 69 | 987 | 967 | 987 | 987 | 987 | 81 | 48 | 46 | STRL0125 |
| 126 | 8 | 43 | 42 | 917 | | | | | | | | STRL0126 |
| 127 | DATA | ISYAR(K,9) | K08,73 | / | | | | | | | | STRL0127 |
| 128 | 1 | 38 | 37 | 977 | 9377 | 937 | 9377 | 937 | 37 | 37 | 38 | STRL0128 |
| 129 | 2 | 39 | 41 | 947 | 9487 | 957 | 9377 | 987 | 71 | 77 | 85 | STRL0129 |
| 130 | 3 | 103 | 137 | 9187 | 92407 | 9387 | 93687 | 9487 | 719 | 742 | 834 | STRL0130 |
| 131 | 4 | 484 | 570 | 9387 | 92717 | 9247 | 92247 | 9287 | 218 | 213 | 221 | STRL0131 |
| 132 | 5 | 238 | 244 | 9287 | 92887 | 9287 | 92997 | 9327 | 426 | 529 | 585 | STRL0132 |
| 133 | 6 | 548 | 1228 | 9387 | 93047 | 9247 | 91907 | 9107 | 111 | 94 | 86 | STRL0133 |
| 134 | 7 | 78 | 71 | 967 | 967 | 987 | 987 | 987 | 47 | 49 | 42 | STRL0134 |
| 135 | 8 | 48 | 39 | 987 | | | | | | | | STRL0135 |
| 136 | DATA | ISYAR(K,10) | K08,73 | / | | | | | | | | STRL0136 |
| 137 | 1 | 38 | 38 | 997 | 9507 | 987 | 987 | 987 | 36 | 37 | 38 | STRL0137 |
| 138 | 2 | 39 | 41 | 947 | 9487 | 957 | 9607 | 987 | 96 | 85 | 96 | STRL0138 |
| 139 | 3 | 128 | 175 | 9257 | 92997 | 9377 | 93137 | 9287 | 657 | 491 | 848 | STRL0139 |
| 140 | 4 | 249 | 1217 | 9177 | 91497 | 9137 | 9127 | 9187 | 125 | 144 | 159 | STRL0140 |
| 141 | 5 | 189 | 184 | 92807 | 92147 | 9227 | 92387 | 9257 | 274 | 328 | 446 | STRL0141 |

| | | | | | | | | | | |
|-----|---|--------------------------|--------|------|--------|-------|------|------|------|----------|
| 142 | 6 | 552, 555, 4207 | 3577 | 2087 | 2237 | 1797 | 633, | 106, | 93, | STRL0142 |
| 143 | 7 | 53, 73, 677 | 617 | 577 | 517 | 407 | 44, | 42, | 40, | STRL0143 |
| 144 | 8 | 38, 36, 887 | | | | | | | | STRL0144 |
| 145 | | DATA (SYAR(K,11),K=73) / | | | | | | | | STRL0145 |
| 146 | 1 | 33, 34, 847 | 557 | 387 | 7 557 | 347 | 34, | 39, | 36, | STRL0146 |
| 147 | 2 | 38, 41, 497 | 497 | 587 | 7 627 | 707 | 81, | 92, | 113, | STRL0147 |
| 148 | 3 | 153, 213, 2267 | 3457 | 4587 | 76487 | 572, | 387, | 269, | 207, | STRL0148 |
| 149 | 4 | 156, 123, 1217 | 7 957 | 987 | 7 987 | 1197 | 105, | 111, | 118, | STRL0149 |
| 150 | 5 | 126, 135, 1467 | 7 1607 | 1787 | 7 1907 | 2027 | 215, | 236, | 273, | STRL0150 |
| 151 | 6 | 382, 308, 3517 | 33987 | 3127 | 72757 | 2187 | 168, | 129, | 103, | STRL0151 |
| 152 | 7 | 38, 76, 677 | 607 | 547 | 7 497 | 497 | 41, | 39, | 37, | STRL0152 |
| 153 | 8 | 36, 34, 837 | | | | | | | | STRL0153 |
| 154 | | DATA (SYAR(K,12),K=73) / | | | | | | | | STRL0154 |
| 155 | 1 | 33, 34, 847 | 557 | 387 | 7 337 | 387 | 33, | 34, | 35, | STRL0155 |
| 156 | 2 | 37, 41, 497 | 507 | 577 | 7 647 | 787 | 87, | 104, | 132, | STRL0156 |
| 157 | 3 | 182, 239, 3847 | 3387 | 5687 | 75087 | 3367 | 238, | 126, | 129, | STRL0157 |
| 158 | 4 | 180, 87, 847 | 817 | 877 | 7 827 | 847 | 86, | 89, | 93, | STRL0158 |
| 159 | 5 | 97, 102, 1187 | 91167 | 1287 | 71367 | 1567 | 164, | 188, | 205, | STRL0159 |
| 160 | 6 | 241, 343, 4717 | 4707 | 3487 | 72947 | 2487 | 193, | 145, | 115, | STRL0160 |
| 161 | 7 | 95, 79, 897 | 817 | 597 | 7 497 | 857 | 41, | 37, | 35, | STRL0161 |
| 162 | 8 | 34, 33, 887 | | | | | | | | STRL0162 |
| 163 | | DATA (SYAR(K,13),K=73) / | | | | | | | | STRL0163 |
| 164 | 1 | 34, 35, 867 | 367 | 387 | 7 327 | 327 | 32, | 33, | 35, | STRL0164 |
| 165 | 2 | 37, 46, 497 | 507 | 587 | 7 667 | 787 | 94, | 117, | 152, | STRL0165 |
| 166 | 3 | 207, 254, 3817 | 4567 | 4577 | 73887 | 2097 | 162, | 128, | 97, | STRL0166 |
| 167 | 4 | 85, 77, 887 | 727 | 787 | 7 737 | 787 | 74, | 75, | 76, | STRL0167 |
| 168 | 5 | 78, 80, 837 | 877 | 927 | 71007 | 11987 | 119, | 131, | 150, | STRL0168 |
| 169 | 6 | 186, 217, 3217 | 4867 | 3787 | 72947 | 2857 | 216, | 164, | 129, | STRL0169 |
| 170 | 7 | 103, 84, 817 | 627 | 577 | 7 497 | 447 | 40, | 38, | 36, | STRL0170 |
| 171 | 8 | 35, 34, 847 | | | | | | | | STRL0171 |
| 172 | | DATA (SYAR(K,14),K=73) / | | | | | | | | STRL0172 |
| 173 | 1 | 35, 32, 897 | 537 | 387 | 7 327 | 317 | 31, | 32, | 34, | STRL0173 |
| 174 | 2 | 39, 40, 497 | 517 | 587 | 7 687 | 827 | 103, | 129, | 163, | STRL0174 |
| 175 | 3 | 203, 258, 3857 | 44187 | 3087 | 72807 | 1617 | 129, | 104, | 87, | STRL0175 |
| 176 | 4 | 73, 68, 867 | 847 | 637 | 7 637 | 637 | 63, | 68, | 64, | STRL0176 |
| 177 | 5 | 64, 65, 877 | 707 | 737 | 7 777 | 887 | 90, | 98, | 109, | STRL0177 |
| 178 | 6 | 129, 159, 1987 | 33097 | 3987 | 72927 | 2497 | 223, | 183, | 142, | STRL0178 |
| 179 | 7 | 112, 88, 837 | 627 | 587 | 7 487 | 447 | 41, | 38, | 37, | STRL0179 |
| 180 | 8 | 38, 35, 857 | | | | | | | | STRL0180 |
| 181 | | DATA (SYAR(K,15),K=73) / | | | | | | | | STRL0181 |
| 182 | 1 | 38, 34, 827 | 537 | 387 | 7 327 | 327 | 32, | 33, | 34, | STRL0182 |
| 183 | 2 | 38, 40, 457 | 527 | 597 | 7 707 | 877 | 116, | 137, | 171, | STRL0183 |
| 184 | 3 | 203, 259, 3887 | 33157 | 2087 | 71637 | 1697 | 115, | 94, | 78, | STRL0184 |
| 185 | 4 | 67, 62, 887 | 567 | 587 | 7 547 | 947 | 55, | 55, | 55, | STRL0185 |
| 186 | 5 | 55, 57, 897 | 607 | 627 | 7 647 | 697 | 73, | 79, | 86, | STRL0186 |
| 187 | 6 | 93, 117, 1457 | 1937 | 2997 | 73107 | 2287 | 215, | 191, | 152, | STRL0187 |
| 188 | 7 | 128, 93, 897 | 637 | 557 | 7 497 | 457 | 42, | 39, | 37, | STRL0188 |
| 189 | 8 | 37, 37, 887 | | | | | | | | STRL0189 |
| 190 | | DATA (SYAR(K,16),K=73) / | | | | | | | | STRL0190 |
| 191 | 1 | 38, 34, 827 | 527 | 387 | 7 327 | 327 | 33, | 33, | 34, | STRL0191 |
| 192 | 2 | 38, 40, 497 | 527 | 687 | 7 727 | 917 | 114, | 139, | 161, | STRL0192 |
| 193 | 3 | 193, 283, 3847 | 22807 | 1687 | 71487 | 1297 | 103, | 88, | 69, | STRL0193 |
| 194 | 4 | 68, 55, 827 | 507 | 687 | 7 487 | 487 | 48, | 49, | 49, | STRL0194 |
| 195 | 5 | 47, 51, 827 | 537 | 587 | 7 577 | 687 | 65, | 69, | 74, | STRL0195 |
| 196 | 6 | 80, 90, 1147 | 1387 | 2887 | 72897 | 2847 | 203, | 188, | 158, | STRL0196 |
| 197 | 7 | 128, 98, 887 | 657 | 577 | 7 517 | 467 | 43, | 48, | 38, | STRL0197 |
| 198 | 8 | 36, 37, 867 | | | | | | | | STRL0198 |
| 199 | | DATA (SYAR(K,17),K=73) / | | | | | | | | STRL0199 |
| 200 | 1 | 38, 33, 827 | 517 | 387 | 7 327 | 337 | 34, | 34, | 34, | STRL0200 |
| 201 | 2 | 38, 40, 497 | 517 | 687 | 7 747 | 937 | 113, | 138, | 148, | STRL0201 |
| 202 | 3 | 197, 281, 2837 | 1787 | 1587 | 71427 | 1687 | 98, | 71, | 59, | STRL0202 |
| 203 | 4 | 93, 44, 877 | 447 | 487 | 7 437 | 487 | 43, | 43, | 44, | STRL0203 |
| 204 | 5 | 49, 46, 877 | 487 | 497 | 7 517 | 587 | 59, | 69, | 69, | STRL0204 |
| 205 | 6 | 74, 80, 947 | 1157 | 1387 | 72167 | 2547 | 197, | 179, | 161, | STRL0205 |
| 206 | 7 | 138, 102, 807 | 677 | 547 | 7 527 | 487 | 44, | 41, | 39, | STRL0206 |
| 207 | 8 | 38, 37, 857 | | | | | | | | STRL0207 |
| 208 | | DATA (SYAR(K,18),K=73) / | | | | | | | | STRL0208 |
| 209 | 1 | 38, 33, 817 | 517 | 387 | 7 337 | 347 | 34, | 35, | 36, | STRL0209 |
| 210 | 2 | 39, 40, 497 | 517 | 687 | 7 747 | 917 | 109, | 128, | 142, | STRL0210 |
| 211 | 3 | 238, 280, 2837 | 1627 | 1687 | 71267 | 1777 | 78, | 62, | 52, | STRL0211 |
| 212 | 4 | 47, 44, 817 | 417 | 387 | 7 397 | 397 | 39, | 39, | 39, | STRL0212 |
| 213 | 5 | 48, 42, 837 | 447 | 487 | 7 477 | 987 | 59, | 81, | 67, | STRL0213 |
| 214 | 6 | 71, 78, 887 | 11807 | 1187 | 71547 | 2287 | 205, | 175, | 162, | STRL0214 |
| 215 | 7 | 138, 104, 837 | 687 | 597 | 7 537 | 487 | 45, | 42, | 39, | STRL0215 |

[illegible]

[illegible]

| | | | | |
|-----|---|---|----------|----|
| 363 | 2 | 78, : 69, : 68, : 67, : 66, : 65, : 64, : 63, : 62, : 61, : 60, : | STRL0363 | |
| 364 | 3 | 59, : 57, : 55, : 54, : 52, : 51, : 49, : 47, : 45, : 43, : | STRL0364 | |
| 365 | 4 | 48, : 45, : 43, : 41, : 39, : 37, : 35, : 33, : 31, : 29, : | STRL0365 | |
| 366 | 5 | 47, : 49, : 48, : 47, : 46, : 45, : 44, : 43, : 42, : 41, : | STRL0366 | |
| 367 | 6 | 53, : 54, : 53, : 52, : 51, : 50, : 49, : 48, : 47, : 46, : | STRL0367 | |
| 368 | 7 | 63, : 64, : 63, : 62, : 61, : 60, : 59, : 58, : 57, : 56, : | STRL0368 | |
| 369 | 8 | 78, : 70, : 61, : 51, : 41, : 31, : 21, : 11, : 01, : 00, : | STRL0369 | |
| 370 | | DATA (STAR(K,36),K,8.73) / | STRL0370 | |
| 371 | 1 | 64, : 64, : 64, : 64, : 64, : 64, : 64, : 64, : 64, : | STRL0371 | |
| 372 | 2 | 63, : 63, : 62, : 62, : 62, : 62, : 62, : 62, : 62, : | STRL0372 | |
| 373 | 3 | 59, : 57, : 56, : 55, : 54, : 53, : 52, : 51, : 50, : | STRL0373 | |
| 374 | 4 | 52, : 52, : 52, : 51, : 50, : 49, : 48, : 47, : 46, : | STRL0374 | |
| 375 | 5 | 51, : 52, : 52, : 52, : 52, : 52, : 52, : 52, : 52, : | STRL0375 | |
| 376 | 6 | 55, : 55, : 56, : 56, : 56, : 56, : 56, : 56, : 56, : | STRL0376 | |
| 377 | 7 | 60, : 60, : 61, : 61, : 61, : 61, : 61, : 61, : 61, : | STRL0377 | |
| 378 | 8 | 64, : 64, : 64, : 64, : 64, : 64, : 64, : 64, : 64, : | STRL0378 | |
| 379 | | DATA (STAR(K,37),K,8.73) / 23457.0 / | STRL0379 | |
| 380 | | ARCSIN(X)=ATAN2(X,SQRT(1.-X*X)) | STRL0380 | |
| 381 | | C DETERMINE THE INERTIAL LATITUDE AND LONGITUDE OF THE POINT IN THE SKY | STRL0381 | |
| 382 | | WHAG 11.02SQRT(W1*W1 + W2*W2 + W3*W3) | STRL0382 | |
| 383 | | A1 = WHAG*WHAG | STRL0383 | 2 |
| 384 | | A2 = W2*WHAG | STRL0384 | 3 |
| 385 | | A3 = W3*WHAG | STRL0385 | 4 |
| 386 | | PHIG = ARCSIN(A3)/CRD | STRL0386 | 5 |
| 387 | | OMEGAG=ATAN2(A2,A1)*RTD | STRL0387 | 6 |
| 388 | | IF (OMEGAG<0.) OMEGAG=360. + OMEGAG | STRL0388 | 7 |
| 389 | | C DETERMINE THE LATITUDE AND LONGITUDE AREA OF THE TABLE TO BE | STRL0389 | |
| 390 | | C CONSIDERED | STRL0390 | |
| 391 | | K = 0.2*OMEGAG + 0.0 | STRL0391 | 10 |
| 392 | | J = 0.2*(PHIG+90.0) + 1.0 | STRL0392 | 11 |
| 393 | | C CALCULATE LONGITUDE INTERVAL FOR PROPER TABLE AREA | STRL0393 | |
| 394 | | Q2 = 50K | STRL0394 | 12 |
| 395 | | Q1 = Q2 - 5.0 | STRL0395 | 13 |
| 396 | | C CALCULATE LATITUDE INTERVAL FOR PROPER TABLE AREA | STRL0396 | |
| 397 | | P2 = 50J + 90 | STRL0397 | 14 |
| 398 | | P1 = P2 - 5.0 | STRL0398 | 15 |
| 399 | | C CALCULATE STAR BRIGHTNESS AT (P1,OMEGAG) | STRL0399 | |
| 400 | | ST1 = STAR(K+1,J) - (STAR(K+1,J)-STAR(K,J)) * (Q2-OMEGAG)/(Q2-Q1) | STRL0400 | 16 |
| 401 | | 1) | STRL0401 | |
| 402 | | C CALCULATE STAR BRIGHTNESS AT (P2,OMEGAG) | STRL0402 | |
| 403 | | S*2 = STAR(K+1,J+1) - (STAR(K+1,J+1)-STAR(K,J+1)) * (Q2-OMEGAG)/(Q2-Q1) | STRL0403 | 17 |
| 404 | | 1 | STRL0404 | |
| 405 | | C CALCULATE STAR BRIGHTNESS AT (PHIG,OMEGAG) | STRL0405 | |
| 406 | | STR = ST2 - ((ST2-ST1) * (Q2-PHIG)) / (P2 - P1) | STRL0406 | 18 |
| 407 | | C CONVERT STAR BRIGHTNESS TO RAYLIGHTS PER ANGSTROM | STRL0407 | |
| 408 | | ST = 0.0039 * STR | STRL0408 | 19 |
| 409 | | GO CONTINUE | STRL0409 | 20 |
| 410 | | RETURN | STRL0410 | 21 |
| 411 | | END | STRL0411 | 22 |

27336 WORDS OF MEMORY USED BY THIS COMPILATION

67906 H2 09-25-72 12,229 TABLE OF UNRESOLVED STARLIGHT

***** SUBROUTINE STRLIT *****

PREFACE

PROGRAM BREAK 5538
COMMON LENGTH 8
V COUNT BYTS 5

PRIMARY SYNDSP ENTRY

STRUIT 0

SECONDARY SYNDSP ENTRY

BLOCK LENGTH

1 BLNR 25
2 BLNR 3

3 BLANKS

2

SUMMER

4 SORT

5 AVAN2

5511 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JHPA 050171/052571

JMRB 050171/052571

JMPC 050171/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

66 19289 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY.

67906 ON 09-25-72 12,233 TOTAL SKY BRIGHTNESS AFTER RELEASE

*****SUBROUTINE TRACK*****

| | | | |
|----|---|--|----------|
| 1 | CYREC | TOTAL SKY BRIGHTNESS AFTER RELEASE | TRAC0001 |
| 2 | C*****SUBROUTINE TRACK***** | | TRAC0002 |
| 3 | C | | TRAC0003 |
| 4 | C*****START OF DOCUMENTATION CARDS***** | | TRAC0004 |
| 5 | C | | TRAC0005 |
| 6 | C*****NASA WACLOPS VERSION OF 02X01A70 | | TRAC0006 |
| 7 | C | | TRAC0007 |
| 8 | C*****LANGUAGE-FORTRAN IV | | TRAC0008 |
| 9 | C | | TRAC0009 |
| 10 | C*****MACHINE-GE 625 | | TRAC0010 |
| 11 | C | | TRAC0011 |
| 12 | C | PURPOSE: | TRAC0012 |
| 13 | C | TO DETERMINE IF THE TOTAL SKY BACKGROUND BRIGHTNESS WILL EXCEED | TRAC0013 |
| 14 | C | THE CONSTRAINT LIMITATION DURING THE REQUIRED EXPERIMENTAL | TRAC0014 |
| 15 | C | PERIOD. | TRAC0015 |
| 16 | C | | TRAC0016 |
| 17 | C*****METHOD: | | TRAC0017 |
| 18 | C | GIVEN A FAVORABLE TIME OR RELEASE FOR STATION(I) FROM | TRAC0018 |
| 19 | C | SUBROUTINE NLITE, DETERMINE IF THE TOTAL SKY BACKGROUND | TRAC0019 |
| 20 | C | BRIGHTNESS IS EXCEEDED DURING THE EXPERIMENTAL PERIOD BY | TRAC0020 |
| 21 | C | CHECKING THIS AT 30 MINUTE INTERVALS, THE INERTIAL RECTANGULAR | TRAC0021 |
| 22 | C | COMPONENTS OF THE VECTOR FROM STATION(I) TO THE CLOUD'S | TRAC0022 |
| 23 | C | POSITION DURING THE EXPERIMENTAL PERIOD ARE FIRST CALCULATED, | TRAC0023 |
| 24 | C | THE VALUES OF ZODIACAL LIGHT AND STARS ARE DETERMINED | TRAC0024 |
| 25 | C | THROUGH SUBROUTINES ZODLIT AND STRLIT RESPECTIVELY, THEN THE | TRAC0025 |
| 26 | C | TOTAL SKY BACKGROUND BRIGHTNESS IS CALCULATED USING THE | TRAC0026 |
| 27 | C | RESPECTIVE VALUES OF AIRGLOW BRIGHTNESS AS FOUND IN | TRAC0027 |
| 28 | C | SUBROUTINE NPAIN, THEN THE TOTAL SKY BACKGROUND BRIGHTNESS IS | TRAC0028 |
| 29 | C | CHECKED AGAINST THE GIVEN CONSTRAINT, IF THE GIVEN CONSTRAINT IS | TRAC0029 |
| 30 | C | EXCEEDED AT ANY POINT CHECKED, THEN THE EVENT CODE IN: IS SET TO | TRAC0030 |
| 31 | C | ONE AND THE SUBROUTINE TERMINATES; | TRAC0031 |
| 32 | C | | TRAC0032 |
| 33 | C*****INPUT: | | TRAC0033 |
| 34 | C | | TRAC0034 |
| 35 | C | R(5) -INPUT VALUE FOR TOTAL SKY BACKGROUND BRIGHTNESS | TRAC0035 |
| 36 | C | -(RAYLEIGHS) | TRAC0036 |
| 37 | C | | TRAC0037 |
| 38 | C | GHA -GREENWICH MEAN SIDEREAL HOUR ANGLE AT ZERO HOUR | TRAC0038 |
| 39 | C | -UNIVERSAL TIME (HRS) | TRAC0039 |
| 40 | C | | TRAC0040 |
| 41 | C | RA(12:7) -AIRGLOW BRIGHTNESS FROM A GIVEN STATION TO THE | TRAC0041 |
| 42 | C | -GIVEN POSITION OF THE CLOUD (RAYLEIGHS) | TRAC0042 |
| 43 | C | | TRAC0043 |
| 44 | C | C(22:9) -COEFFICIENT DEPENDENT UPON THE RELATIVE POSITION | TRAC0044 |
| 45 | C | -OF THE TRACKING STATION TO THE CLOUD AND USED TO | TRAC0045 |
| 46 | C | -SOLVE FOR THE TOTAL SKY BACKGROUND BRIGHTNESS | TRAC0046 |
| 47 | C | | TRAC0047 |
| 48 | C | JEND -NUMBER OF DISCRETE VALUES STORED FOR | TRAC0048 |
| 49 | C | -EXPERIMENTAL PERIOD DATA | TRAC0049 |
| 50 | C | | TRAC0050 |
| 51 | C | ZD -ZODIACAL LIGHT BRIGHTNESS OF A POINT IN THE SKY | TRAC0051 |
| 52 | C | -(RAYLEIGHS) | TRAC0052 |
| 53 | C | | TRAC0053 |
| 54 | C | SY -UNRESOLVED STAR BRIGHTNESS OF A POINT IN THE SKY | TRAC0054 |
| 55 | C | -(RAYLEIGHS) | TRAC0055 |
| 56 | C | | TRAC0056 |
| 57 | C | WVX(12:7) -VALUE OF DECENTRIC X COMPONENT OF VECTOR FROM | TRAC0057 |
| 58 | C | -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE | TRAC0058 |

| | | | | | |
|-----|---|---|--|----------|----|
| 59 | C | | | TRAC0059 | |
| 60 | C | WPY(12,7) | -VALUE OF GEOCENTRIC Y COMPONENT OF VECTOR FROM | TRAC0060 | |
| 61 | C | | -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE | TRAC0061 | |
| 62 | C | | | TRAC0062 | |
| 63 | C | WPZ(12,7) | -VALUE OF GEOCENTRIC Z COMPONENT OF VECTOR FROM | TRAC0063 | |
| 64 | C | | -STATION TO CLOUD AT DISCRETE TIMES AFTER RELEASE | TRAC0064 | |
| 65 | C | | | TRAC0065 | |
| 66 | C | T | -PRESENT UNIVERSAL TIME FOR RELEASE | TRAC0066 | |
| 67 | C | | | TRAC0067 | |
| 68 | C | I | -STATION NUMBER | TRAC0068 | |
| 69 | C | | | TRAC0069 | |
| 70 | C | | | TRAC0070 | |
| 71 | C | *****OUTPUT- | | TRAC0071 | |
| 72 | C | | | TRAC0072 | |
| 73 | C | N | -EVENT CODE | TRAC0073 | |
| 74 | C | | - 001P BT(1,2,3,4,5) | TRAC0074 | |
| 75 | C | | - 011P BT(6,7,8,9) | TRAC0075 | |
| 76 | C | | | TRAC0076 | |
| 77 | C | *****RESTRICTIONS- | | TRAC0077 | |
| 78 | C | | THIS SUBROUTINE ACCEPTS UP TO A MAXIMUM OF TWELVE TRACKING | TRAC0078 | |
| 79 | C | | STATIONS AND COMPUTES A MAXIMUM OF SEVEN DISCRETE POINTS AT 30 | TRAC0079 | |
| 80 | C | | MINUTE INTERVALS DURING THE EXPERIMENTAL PERIOD. | TRAC0080 | |
| 81 | C | | | TRAC0081 | |
| 82 | C | *****SUBPROGRAMS REQUIRED- | | TRAC0082 | |
| 83 | C | ZODLIY | | TRAC0083 | |
| 84 | C | ITY | | TRAC0084 | |
| 85 | C | ZYABLE | | TRAC0085 | |
| 86 | C | STRLIY | | TRAC0086 | |
| 87 | C | | | TRAC0087 | |
| 88 | C | | | TRAC0088 | |
| 89 | C | *****END OF DOCUMENTATION CARDS***** | | TRAC0089 | |
| 90 | C | | | TRAC0090 | |
| 91 | | SUBROUTINE TRACK (TPNTI) | | TRAC0091 | |
| 92 | | COMMON/BLK1/R(8) | | TRAC0092 | |
| 93 | | COMMON/BLK2/DTR, RVD, MTR, HALPFI, RTH, AU, DELTA(4), ERH, DGHA | | TRAC0093 | |
| 94 | | COMMON/BLK3/SUNL, GHA | | TRAC0094 | |
| 95 | | COMMON/BLK4/WHX(12), WY(12), WZ(12), BA(12,7), C(12,7), JEND | | TRAC0095 | |
| 96 | | COMMON/BLK5/W1, W2, W3 | | TRAC0096 | |
| 97 | | COMMON/BLK6/3ZD, ST | | TRAC0097 | |
| 98 | | COMMON/BLK7/HPX(12,7), WPY(12,7), WPZ(12,7) | | TRAC0098 | |
| 99 | | DOUBLE PRECISION DTR, RVD, MTR, HALPFI | | TRAC0099 | |
| 100 | C | CALCULATE THE UNIVERSAL TIME IN HOURS FOR THE POINT TO BE COMPUTED, | | TRAC0100 | |
| 101 | | DO 100 J=2,JEND | | TRAC0101 | |
| 102 | | YJ = J | | TRAC0102 | 2 |
| 103 | | YR = 0.500*(YJ-126) | | TRAC0103 | 3 |
| 104 | C | CALCULATE THE SINE AND COSINE OF THE HOUR ANGLE FOR TIME TP, | | TRAC0104 | |
| 105 | | SH = SIN(DGHA + YR * DGHA) * MTR | | TRAC0105 | 4 |
| 106 | | CS = COS(DGHA + YR * DGHA) * MTR | | TRAC0106 | 5 |
| 107 | C | DETERMINE THE INERTIAL RECTANGULAR COMPONENTS OF THE VECTOR FROM | | TRAC0107 | |
| 108 | C | STATION(I) TO THE CLOUDS PRESENT AT TIME TP | | TRAC0108 | |
| 109 | | W1 = WPX(I,J) * CS - WPY(I,J) * SH | | TRAC0109 | 6 |
| 110 | | W2 = WPX(I,J) * SH + WPY(I,J) * CS | | TRAC0110 | 7 |
| 111 | | W3 = WPZ(I,J) | | TRAC0111 | 8 |
| 112 | C | FIND THE SKY BRIGHTNESS DUE TO ZODIACAL LIGHT AND STARLIGHT | | TRAC0112 | |
| 113 | | CALL ZODLIY (YP) | | TRAC0113 | 9 |
| 114 | | CALL STRLIY | | TRAC0114 | 10 |
| 115 | C | FIND TOTAL SKY BRIGHTNESS | | TRAC0115 | |
| 116 | | BT = BA(I,J) + (187+2D) * C(I,J) | | TRAC0116 | 11 |
| 117 | | GO CONTINUE | | TRAC0117 | 12 |
| 118 | C | RETURN IF ST,GT,R(5), OTHERWISE CONTINUE | | TRAC0118 | |
| 119 | | IF (BT,LT,R(5)) GO TO 100 | | TRAC0119 | 13 |
| 120 | | N = 1 | | TRAC0120 | 16 |
| 121 | | RETURN | | TRAC0121 | 17 |
| 122 | | 100 CONTINUE | | TRAC0122 | 18 |
| 123 | | RETURN | | TRAC0123 | 20 |
| 124 | | END | | TRAC0124 | 21 |

23889 WORDS OF MEMORY USED BY THIS COMPILATION

67906 02 09-25-72 12,236 TOTAL SKY BRIGHTNESS AFTER RELEASE

*****SUBROUTINE TRACK*****

PREFACE

PROGRAM BREAK 170
COMMON LENGTH 0
V COUNT DIVS 5

PRIMARY SYNDOP ENTRY

TRACK 0

SECONDARY SYNDOP ENTRY

BLOCK LENGTH

| BLOCK | LENGTH |
|---------|--------|
| 1 BLK01 | 10 |
| 2 BLK02 | 20 |
| 3 BLK03 | 8 |
| 4 BLK04 | 315 |
| 5 BLK05 | 5 |
| 6 BLK06 | 2 |
| 7 BLK07 | 370 |

SYNREF

10 C03
11 SIN
12 SYNDOP
13 ZODIAC

174 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JHPA 050170/052521 JHRB 050271/052521 JHPC 050171/052571

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

** 19309 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY.

67906 02 09-25-72 12,240 LAUNCH WINDOW OUTPUT

*****SUBROUTINE OUTPUT*****

| LINE | DESCRIPTION | OUTPUT |
|------|--|----------|
| 1 | CHUT1 LAUNCH WINDOW OUTPUT | OUT10001 |
| 2 | *****SUBROUTINE OUTPUT***** | OUT10002 |
| 3 | C | OUT10003 |
| 4 | *****START OF DOCUMENTATION CARDS***** | OUT10004 |
| 5 | C | OUT10005 |
| 6 | *****NABA WALLOPS VERSION OF 02/01/70 | OUT10006 |
| 7 | C | OUT10007 |
| 8 | *****LANGUAGE=FORTRAN IV | OUT10008 |
| 9 | C | OUT10009 |
| 10 | *****MACHINE=CR 625 | OUT10010 |
| 11 | C | OUT10011 |
| 12 | *****PURPOSE | OUT10012 |
| 13 | C TO WRITE THE DAILY RELEASE TIMES PER CONSTRAINT PER STATION ON | OUT10013 |
| 14 | C OUTPUT FILE 07. | OUT10014 |
| 15 | C | OUT10015 |
| 16 | *****METHOD | OUT10016 |
| 17 | C GIVEN THE PROPER CONSTRAINT INDEX NUMBER, WRITE THE CONSTRAINT | OUT10017 |
| 18 | C INDEX NUMBER, THE CURRENT DATE, THE CONSTRAINT NAME, THE STATION | OUT10018 |
| 19 | C NAME (IF NOT EARLY SHADOW CONSTRAINT), THE CALCULATED RELEASE | OUT10019 |
| 20 | C START/STOP TIMES, AND THE STATION NUMBER IN PROPER BCD FORMAT TO | OUT10020 |
| 21 | C INBUND CORRECT PRINTING IN SUBROUTINE 'OUTYPE', | OUT10021 |
| 22 | C | OUT10022 |
| 23 | *****INPUTS | OUT10023 |
| 24 | C | OUT10024 |
| 25 | C K -INDEX FOR CONSTRAINTS | OUT10025 |
| 26 | C -#1, EARTH SHADOW | OUT10026 |
| 27 | C -#2, NOT USED | OUT10027 |
| 28 | C -#3, SUN | OUT10028 |
| 29 | C -#4, MOON | OUT10029 |
| 30 | C -#5, TOTAL SKY BACKGROUND BRIGHTNESS | OUT10030 |

| | | | | |
|-----|---|--|---|----------|
| 31 | C | | | OUT10031 |
| 32 | C | DJUL | -JULIAN DATE FOR CURRENT DATA | OUT10032 |
| 33 | C | | | OUT10033 |
| 34 | C | WINDOW(5,5,12) | -THE DAILY RELEASE WINDOW START/STOP TIMES, | OUT10034 |
| 35 | C | | -1ST INDEX FOR STORING START/STOP TIMES, | OUT10035 |
| 36 | C | | -19375 FOR START TIMES | OUT10036 |
| 37 | C | | -20476 FOR STOP TIMES | OUT10037 |
| 38 | C | | -2ND INDEX FOR THE CONSTRAINT | OUT10038 |
| 39 | C | | - 1=EARTH SHADOW | OUT10039 |
| 40 | C | | - 2=ELEVATION | OUT10040 |
| 41 | C | | - 3=SUN | OUT10041 |
| 42 | C | | - 4=MOON | OUT10042 |
| 43 | C | | - 5=TOTAL SKY BACKGROUND BRIGHTNESS | OUT10043 |
| 44 | C | | | OUT10044 |
| 45 | C | NS | -THE NUMBER OF STATIONS USED IN THE PROGRAM | OUT10045 |
| 46 | C | | | OUT10046 |
| 47 | C | NOB(12) | -AN ARRAY CONTAINING THE STATION NUMBERS USED | OUT10047 |
| 48 | C | | | OUT10048 |
| 49 | C | | | OUT10049 |
| 50 | C | *****OUTPUY- | | OUT10050 |
| 51 | C | ON FILE 07 | | OUT10051 |
| 52 | C | | | OUT10052 |
| 53 | C | K | -INDEX FOR CONSTRAINTS | OUT10053 |
| 54 | C | | -01,EARTH SHADOW | OUT10054 |
| 55 | C | | -02,NOT USED | OUT10055 |
| 56 | C | | -03,SUN | OUT10056 |
| 57 | C | | -04,MOON | OUT10057 |
| 58 | C | | -05,TOTAL SKY BACKGROUND BRIGHTNESS | OUT10058 |
| 59 | C | | | OUT10059 |
| 60 | C | IDAY | -DAY NUMBER FOR DATE OF CURRENT DATA | OUT10060 |
| 61 | C | | | OUT10061 |
| 62 | C | IMONTH | -MONTH FOR DATE OF CURRENT DATA | OUT10062 |
| 63 | C | | | OUT10063 |
| 64 | C | MONTH | -NAME OF MONTH CORRESPONDING TO IMONTH | OUT10064 |
| 65 | C | | | OUT10065 |
| 66 | C | IYEAR | -YEAR FOR DATE OF CURRENT DATA | OUT10066 |
| 67 | C | | | OUT10067 |
| 68 | C | NRSTR(5) | -ALPHANUMERIC NAME OF CONSTRAINT | OUT10068 |
| 69 | C | | | OUT10069 |
| 70 | C | NAME(5,12) | -NAME OF TRACKING STATIONS USED | OUT10070 |
| 71 | C | | | OUT10071 |
| 72 | C | WINDOW(5,5,12) | -THE DAILY RELEASE WINDOW START/STOP TIMES, | OUT10072 |
| 73 | C | | -1ST INDEX FOR STORING START/STOP TIMES, | OUT10073 |
| 74 | C | | -19375 FOR START TIMES | OUT10074 |
| 75 | C | | -20476 FOR STOP TIMES | OUT10075 |
| 76 | C | | -2ND INDEX FOR THE CONSTRAINT | OUT10076 |
| 77 | C | | - 1=EARTH SHADOW | OUT10077 |
| 78 | C | | - 2=ELEVATION | OUT10078 |
| 79 | C | | - 3=SUN | OUT10079 |
| 80 | C | | - 4=MOON | OUT10080 |
| 81 | C | | - 5=TOTAL SKY BACKGROUND BRIGHTNESS | OUT10081 |
| 82 | C | | | OUT10082 |
| 83 | C | J | -CODE TO SUBROUTINE OUTTYPE TO SIGNAL THAT STATION | OUT10083 |
| 84 | C | | -BEING READ IS FIRST ONE FOR THAT PARTICULAR | OUT10084 |
| 85 | C | | -CONSTRAINT OR IT IS NOT | OUT10085 |
| 86 | C | | | OUT10086 |
| 87 | C | *****RESTRICTIONS- | | OUT10087 |
| 88 | C | | THIS SUBROUTINE IS SPECIFICALLY DESIGNED FOR PRINTING THE | OUT10088 |
| 89 | C | | PARAMETERS GENERATED BY THE CURRENT VERSION OF PROGRAM | OUT10089 |
| 90 | C | ISICWINDOW | | OUT10090 |
| 91 | C | | | OUT10091 |
| 92 | C | *****SUBPROGRAMS REQUIRED- | | OUT10092 |
| 93 | C | CALDAY | | OUT10093 |
| 94 | C | | | OUT10094 |
| 95 | C | *****END OF DOCUMENTATION CARDS***** | | OUT10095 |
| 96 | C | | | OUT10096 |
| 97 | C | SUBROUTINE OUT1 (K) | | OUT10097 |
| 98 | C | COMMON/BLK12 DJUL, NOB, NS, MONTH, EPOCH | | OUT10098 |
| 99 | C | COMMON/BLK2 PMS, NOB(12) | | OUT10099 |
| 100 | C | COMMON/BLK3 NAME(5,12), PH2(12), LAMBDA(12), ALT(12), MOVE(12) | | OUT10100 |
| 101 | C | COMMON/BLK4 WINDOW(5,5,12) | | OUT10101 |
| 102 | C | COMMON/BLK5 LINE, IYEAR, IMONTH, IDAY | | OUT10102 |
| 103 | C | DIMENSION N(12) | | OUT10103 |


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104 DIMENSION MONTH(12) OUT10104
105 DIMENSION NRESTR(3,5) OUT10105
106 DATA NILUM76W ALL,6W STAT,5HONS / OUT10106
107 DATA MONTH,3HJAN,3HFEB,3HMAR,3HAPR,3HMAJ,3HJUN,3HJUL,3HAUG,3HSEP, OUT10107
108 1 3HOCT,3HNOV,3HDEC / OUT10108
109 DATA (NRESTR(I,1),I=1,3)/6W EAR,6WTH SHA,6WDOV / OUT10109
110 DATA (NRESTR(I,2),I=1,3)/6W .6W .6W / OUT10110
111 DATA (NRESTR(I,3),I=1,3)/6W .6W SUN .6W / OUT10111
112 DATA (NRESTR(I,4),I=1,3)/6W .6W MOON .6W / OUT10112
113 DATA (NRESTR(I,5),I=1,3)/6W SKY .6WBRIGHT,6WNESS / OUT10113
114 GO TO (1,2,3,3,3),K OUT10114
115 C EARTH SHADOW DATA IS FIRST PRINTED FOR THIS DATE,PRINT JULIAN DATE, OUT10115
116 C FIND THE CURRENT DATE FROM THE GIVEN DAY NUMBER,AND WRITE OUTPUT OUT10116
117 C PARAMETERS ON TAPE FILE 97, OUT10117
118 1 WRITE (7,1000) DJUL OUT10118 2
119 CALL CALDAY OUT10119 3
120 J = 1 OUT10120 6
121 WRITE (7,1001) K, IDAY, MONTH(I,MONTH), IYEAR, (NRESTR(L,K),L=1,3), OUT10121 7
122 1 NILUM, (WINDOW(L,K,7),L=1,5), J OUT10122
123 GO TO 2 OUT10123 18
124 C WRITE DATA FOR (K) CONSTRAINT ON TAPE FILE 97, OUT10124
125 3 DO 100 I=1,5NS OUT10125 19
126 J = NOS(I) OUT10126 20
127 100 WRITE (7,1001) K, IDAY, MONTH(I,MONTH), IYEAR, (NRESTR(L,K),L=1,3), OUT10127 21
128 1 (NAME(L,U),L=1,3), (WINDOW(L,K,7),L=1,5), I OUT10128
129 2 RETURN OUT10129 35
130 1000 FORMAT (F10,2,120X) OUT10130 36
131 1001 FORMAT (I0X,2I2,A3,I476A6,6F12,5,11) OUT10131 36
132 END OUT10132 36

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23737 WORDS OF MEMORY USED BY THIS COMPILATION

67906 02 09-25-72 12,244 LAUNCH WINDOW OUTPUT

*****SUBROUTINE OUT1*****

PREPAGE

PROGRAM BREAK 334
COMMON LENGTH 0
V COUNT 0175 5

PRIMARY SYMDEF ENTRY

OUT1 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

| | | |
|---|------|-----|
| 1 | BLK1 | 4 |
| 2 | BLK2 | 15 |
| 3 | BLK3 | 124 |
| 4 | BLK4 | 550 |
| 5 | BLK5 | 4 |

SYMDEF

6 CALDAY
7 FENV,
10 FEXIT
11 FPIL,
12 FUGO,
13 FWRD,
14 FWRM,

334 IS THE NEXT AVAILABLE LOCATION

GNAP VERSION/ASSEMBLY DATES JMRB 050171/052571 JMRB 050171/052571 J4PC 050171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
66 19339 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY

07906 02 09-25-72 12,247 DEFINITION OF DAYS

*****SUBROUTINE CALDAY*****

| | | | |
|----|---|---|----------|
| 1 | CHALO | DEFINITION OF DAYS | CALD0001 |
| 2 | C*****SUBROUTINE CALDAY***** | | CALD0002 |
| 3 | C | | CALD0003 |
| 4 | C*****START OF DOCUMENTATION CARDS***** | | CALD0004 |
| 5 | C | | CALD0005 |
| 6 | C*****NASA WOLLOPS VERSION OF 52701AY0 | | CALD0006 |
| 7 | C | | CALD0007 |
| 8 | C*****LANGUAGE=FORTRAN IV | | CALD0008 |
| 9 | C | | CALD0009 |
| 10 | C*****MAGWINE-GE 625 | | CALD0010 |
| 11 | C | | CALD0011 |
| 12 | C*****PURPOSE- | | CALD0012 |
| 13 | C | TO FIND THE DATE OF THE CURRENT DAY | CALD0013 |
| 14 | C | | CALD0014 |
| 15 | C*****METHOD- | | CALD0015 |
| 16 | C | GIVEN THE YEAR FOR WHICH THE CALCULATIONS BEGIN (KYEAR), AND THE | CALD0016 |
| 17 | C | CURRENT NUMBER OF DAYS PAST JANUARY 0 OF THE GIVEN YEAR (IDAY), | CALD0017 |
| 18 | C | FIRST DETERMINE IF THE GIVEN YEAR IS THE CURRENT YEAR BY | CALD0018 |
| 19 | C | DETERMINING IF 'IDAY' IS BETWEEN 0 AND 365 (366 IF 'KYEAR' IS A | CALD0019 |
| 20 | C | LEAP YEAR), THE CURRENT YEAR IS THEN STORED (IYEAR) AND | CALD0020 |
| 21 | C | ADJUSTMENT IS MADE TO 'IDAY' TO REFLECT THE NUMBER OF DAYS PAST | CALD0021 |
| 22 | C | JANUARY 0 OF 'IYEAR'. | CALD0022 |
| 23 | C | A TABLE OF VALUES IS GIVEN FOR THE NUMBER OF DAYS IN EACH MONTH | CALD0023 |
| 24 | C | (ADJUSTMENT MADE FOR FEBRUARY OF A LEAP YEAR); THE MONTH NUMBER | CALD0024 |
| 25 | C | IS THEN FOUND BY CHECKING AND ADJUSTING 'IDAY'. | CALD0025 |
| 26 | C | | CALD0026 |
| 27 | C*****INPUT- | | CALD0027 |
| 28 | C | | CALD0028 |
| 29 | C | KYEAR -YEAR NUMBER FOR STARTING CALCULATIONS | CALD0029 |
| 30 | C | | CALD0030 |
| 31 | C | IDAY -CURRENT NUMBER OF DAYS PAST JANUARY 0 OF KYEAR | CALD0031 |
| 32 | C | | CALD0032 |
| 33 | C | | CALD0033 |
| 34 | C*****OUTPUT- | | CALD0034 |
| 35 | C | | CALD0035 |
| 36 | C | IYEAR -YEAR FOR DATE OF CURRENT DATA | CALD0036 |
| 37 | C | | CALD0037 |
| 38 | C | IMONTH -MONTH FOR DATE OF CURRENT DATA | CALD0038 |
| 39 | C | | CALD0039 |
| 40 | C | IDAY -DAY NUMBER FOR DATE OF CURRENT DATA | CALD0040 |
| 41 | C | | CALD0041 |
| 42 | C*****RESTRICTIONS- | | CALD0042 |
| 43 | C | THIS SUBROUTINE WILL COMPUTE THE YEAR, MONTH NUMBER, AND DAY FOR | CALD0043 |
| 44 | C | ANY YEAR EXCEPT THOSE YEARS FOR WHICH 'IYEAR/4' IS AN INTEGRAL | CALD0044 |
| 45 | C | VALUE BUT 'IYEAR' IS NOT A LEAP YEAR (I.E., THE YEAR 2000), | CALD0045 |
| 46 | C | | CALD0046 |
| 47 | C*****SUBROUTINES REQUIRED- | | CALD0047 |
| 48 | C | NONE | CALD0048 |
| 49 | C | | CALD0049 |
| 50 | C*****END OF DOCUMENTATION CARDS***** | | CALD0050 |
| 51 | C | | CALD0051 |
| 52 | C | SUBROUTINE CALDAY | CALD0052 |
| 53 | C | COMMON/BLKX /KMONTH, IDAY, KYEAR, LMONTH, LDAY, LYEAR, KNO, KDA, | CALD0053 |
| 54 | C | 1 KYR, LMOY LDA, LYR, ICALE, IPRTY, INRT9, IPRY21, IPLOT | CALD0054 |
| 55 | C | COMMON/BLK0 / LINE, IYEAR, IMONTH, IDAY | CALD0055 |
| 56 | C | DIMENSION NDAYS(12) | CALD0056 |
| 57 | C | DATA NDAYS/31,28,31,30,31,30,31,31,30,31,30,31/ | CALD0057 |
| 58 | C | IYEAR =KYEAR | CALD0058 |
| 59 | C | 14 NDPYR =365 | CALD0059 |
| 60 | C | IF THIS A LEAP YEAR | CALD0060 |
| 61 | C | IF (MOD(IYEAR,4).EQ.0) GO TO 21 | CALD0061 |
| 62 | C | GO TO 12 | CALD0062 |
| 63 | C | CHANGE THE NUMBER OF DAYS PER YEAR AND THE NUMBER OF DAYS IN FEBRUARY | CALD0063 |
| 64 | C | FOR CORRECT LEAP YEAR VALUES, | CALD0064 |
| 65 | C | 11 NDPYR =366 | CALD0065 |
| 66 | C | NDAYS(2) =29 | CALD0066 |
| 67 | C | CHECK FOR KYEAR TO BE THE CURRENT YEAR, | CALD0067 |
| 68 | C | 12 IF (IDAY,GT.0) AND (IDAY,LT.(NDPYR+1)) GO TO 14 | CALD0068 |
| 69 | C | IF (IDAY,GT.0) GO TO 21 | CALD0069 |

| | | | |
|----|--|-----------|----|
| 70 | C CURRENT YEAR IS PRIOR YEAR TO GIVEN YEAR; | CALD00076 | |
| 71 | 10000 010000 -1 | CALD00077 | 15 |
| 72 | 1000 01000 0300 | CALD00078 | 16 |
| 73 | 00 00 00 | CALD00079 | 17 |
| 74 | C CURRENT YEAR IS NEXT YEAR TO GIVEN YEAR; | CALD00080 | |
| 75 | 20 10000 010000 01 | CALD00081 | 18 |
| 76 | 1000 01000 0300 | CALD00082 | 19 |
| 77 | 00000100000 | CALD00083 | 20 |
| 78 | 00 00 00 | CALD00084 | 21 |
| 79 | C DETERMINE THE CORRECT MONTH NUMBER AND DAY OF CURRENT MONTH, | CALD00085 | |
| 80 | 03 00 100 1000001.12 | CALD00086 | 22 |
| 81 | 10 1000 01000 0300 | CALD00087 | 23 |
| 82 | 100 1000 01000 0300 | CALD00088 | 24 |
| 83 | 01 00000 | CALD00089 | 25 |
| 84 | END | CALD00090 | 27 |

20090 WORDS OF MEMORY USED BY THIS COMPILE

07906 02 09-25-72 12,250 DEFINITION OF DATE

*****SUBROUTINE BALDAY*****

PREFACE

PROGRAM BREAK 102
COMMON LENGTH 0
V COUNTS 0

PRIMARY SYMBOL ENTRY

CALDAY 0

SECONDARY SYMBOL ENTRY

BLOCK LENGTH

1 BLK 02
2 BLK 0

SUMREF

122 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATE JHPA 050172/052521 JHRB 050171/052521 JHPC 050171/052521
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
** 19299 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY.

07906 02 09-25-72 12,250 COMBINED WINDOW INTERVALS

*****SUBROUTINE YTLW00*****

| | | | |
|----|------------------------------|--|----------|
| 1 | CYTLW | COMBINED WINDOW INTERVALS | YTLW0001 |
| 2 | C*****SUBROUTINE YTLW00***** | | YTLW0002 |
| 3 | C | | YTLW0003 |
| 4 | C*****SUBROUTINE YTLW00***** | | YTLW0004 |
| 5 | C | | YTLW0005 |
| 6 | C*****SUBROUTINE YTLW00***** | | YTLW0006 |
| 7 | C | | YTLW0007 |
| 8 | C*****SUBROUTINE YTLW00***** | | YTLW0008 |
| 9 | C | | YTLW0009 |
| 10 | C*****SUBROUTINE YTLW00***** | | YTLW0010 |
| 11 | C | | YTLW0011 |
| 12 | C*****SUBROUTINE YTLW00***** | | YTLW0012 |
| 13 | C | TO COMPUTE THE COMBINED DAILY RELEASE WINDOW FOR THE BIG | YTLW0013 |
| 14 | C | PROJECT | YTLW0014 |
| 15 | C | | YTLW0015 |
| 16 | C*****SUBROUTINE YTLW00***** | | YTLW0016 |
| 17 | C | GIVEN THE DAILY RELEASE WINDOWS AS CALCULATED FOR EACH STATION | YTLW0017 |
| 18 | C | AND FOR EACH CONSTRAINT, THE RESULT OF THIS SUBROUTINE IS TO | YTLW0018 |
| 19 | C | Determine the time intervals for the current day which satisfy each of | YTLW0019 |

| | | | |
|----|---|--|----------|
| 20 | C | THE GIVEN TIME INTERVALS ALWAYS FOUND FOR EACH STATION AND FOR ALL | YTLW0020 |
| 21 | C | SUCH CONSTRAINT, THE REVERSE USE OF STATION DATA THREE NUMBERS; | YTLW0021 |
| 22 | C | IDENTIFYING THE INTERSECTION OF THE DAILY RELEASE WINDOWS FOUND | YTLW0022 |
| 23 | C | FOR THAT STATION FOR EACH CONSTRAINT THROUGH INTERSECTING | YTLW0023 |
| 24 | C | INTERVALS FOUND AND THEN STORED IN THE 140 AND 141 ARRAYS; | YTLW0024 |
| 25 | C | SECOND, THE INTERSECTION OF THE TIME INTERVALS DEFINED IN THESE | YTLW0025 |
| 26 | C | ARRAYS ARE THEN DETERMINED AND STORED IN 142 AND 143 ARRAYS; | YTLW0026 |
| 27 | C | THIRD, THESE TIME INTERVALS ARE COMBINED WITH BACKGROUND | YTLW0027 |
| 28 | C | COMPUTED BASES ON VHS JOB THE BACKGROUND CASES, THESE ARE THEN | YTLW0028 |
| 29 | C | STORED IN FILE OF FOR PLOTTING AND/OR PRINTING; | YTLW0029 |
| 30 | C | | YTLW0030 |
| 31 | C | *****INQUIRY | YTLW0031 |
| 32 | C | | YTLW0032 |
| 33 | C | NS -THE NUMBER OF STATIONS USED IN THE PROGRAM | YTLW0033 |
| 34 | C | | YTLW0034 |
| 35 | C | NOU1501 -AN ARRAY CONTAINING THE STATION NUMBERS USED | YTLW0035 |
| 36 | C | | YTLW0036 |
| 37 | C | WINDOW(1,5,12) -THE DAILY RELEASE WINDOW START/STOP TIMES, | YTLW0037 |
| 38 | C | -1ST INDEX FOR STARTING START/STOP TIMES; | YTLW0038 |
| 39 | C | -10023 FOR START TIMES | YTLW0039 |
| 40 | C | -20426 FOR STOP TIMES | YTLW0040 |
| 41 | C | -2ND INDEX FOR THE CONSTRAINT | YTLW0041 |
| 42 | C | - 1-WARREN SHADON | YTLW0042 |
| 43 | C | - 2-SHADON | YTLW0043 |
| 44 | C | - 3-SHON | YTLW0044 |
| 45 | C | - 4-SHON | YTLW0045 |
| 46 | C | - 5-TOTAL SKY BACKGROUND WEIGHTNESS | YTLW0046 |
| 47 | C | | YTLW0047 |
| 48 | C | BJUL -JULIAN DATE FOR CURRENT DATA | YTLW0048 |
| 49 | C | | YTLW0049 |
| 50 | C | NDFJ0 -NUMBER OF DAYS RANG FROM DATE TO DATE FOR | YTLW0050 |
| 51 | C | -STARTING CALCULATIONS (INTEGER) | YTLW0051 |
| 52 | C | | YTLW0052 |
| 53 | C | NDFE -NUMBER OF DAYS RANG FROM DATE TO DATE FOR | YTLW0053 |
| 54 | C | -STOPPING CALCULATIONS (INTEGER) | YTLW0054 |
| 55 | C | | YTLW0055 |
| 56 | C | ICASE -INTEGER VALUE OR CASE NUMBER | YTLW0056 |
| 57 | C | | YTLW0057 |
| 58 | C | IFINAL -INTEGER CODE NOTING LAST CASE | YTLW0058 |
| 59 | C | -00; MORE CASES TO FOLLOW | YTLW0059 |
| 60 | C | -01; THIS IS THE FINAL CASE | YTLW0060 |
| 61 | C | | YTLW0061 |
| 62 | C | I -CURRENT NUMBER OF DAYS FROM FIRST DAY CALCULATED | YTLW0062 |
| 63 | C | | YTLW0063 |
| 64 | C | | YTLW0064 |
| 65 | C | *****SUBROUTINE | YTLW0065 |
| 66 | C | | YTLW0066 |
| 67 | C | BJUL -JULIAN DATE FOR CURRENT DATA | YTLW0067 |
| 68 | C | | YTLW0068 |
| 69 | C | BYEAR -YEAR FOR DATE OF CURRENT DATA | YTLW0069 |
| 70 | C | | YTLW0070 |
| 71 | C | BMONTH -MONTH FOR DATE OF CURRENT DATA | YTLW0071 |
| 72 | C | | YTLW0072 |
| 73 | C | BDAY -DAY NUMBER FOR DATE OF CURRENT DATA | YTLW0073 |
| 74 | C | | YTLW0074 |
| 75 | C | G(1) -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT | YTLW0075 |
| 76 | C | -DATE | YTLW0076 |
| 77 | C | | YTLW0077 |
| 78 | C | G(2) -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT | YTLW0078 |
| 79 | C | -DATE | YTLW0079 |
| 80 | C | | YTLW0080 |
| 81 | C | G(3) -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT | YTLW0081 |
| 82 | C | -DATE FOR ALL INPUT CASES | YTLW0082 |
| 83 | C | | YTLW0083 |
| 84 | C | G(4) -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT | YTLW0084 |
| 85 | C | -DATE FOR ALL INPUT CASES | YTLW0085 |
| 86 | C | | YTLW0086 |
| 87 | C | *****RESTRICTIONS | YTLW0087 |
| 88 | C | ONLY THESE CONSTRAINTS ARE CURRENTLY COMPUTED IN THE SICHON | YTLW0088 |
| 89 | C | COMPUTED PROGRAM CAN BE COMBINED | YTLW0089 |
| 90 | C | UP TO A MAXIMUM OF TWELVE TRAINING STATIONS CAN BE COMBINED | YTLW0090 |
| 91 | C | A MAXIMUM OF SIX COMBINED INTERVALS CAN BE COMPUTED FOR A GIVEN | YTLW0091 |
| 92 | C | DAY | YTLW0092 |

| Line | Code | Text | Address | Count |
|------|------|--|------------|-------|
| 93 | C | | YTLW0893 | |
| 94 | C | COMMON SUBROUTINES REQUIRED- | YTLW0894 | |
| 95 | C | 1985 | YTLW0895 | |
| 96 | C | | YTLW0896 | |
| 97 | C | COMMON SUBROUTINE OF DOCUMENTATION CARD | YTLW0897 | |
| 98 | C | | YTLW0898 | |
| 99 | C | SUBROUTINE YTLW08 (1) | YTLW0899 | |
| 100 | C | COMMON BLOCK 1, JUL, MONTH, DAY, YEAR | YTLW0900 | |
| 101 | C | COMMON BLOCK 2, PMS, MONTH(12) | YTLW0901 | |
| 102 | C | COMMON BLOCK 3, WINDOW(1000,12) | YTLW0902 | |
| 103 | C | COMMON BLOCK 4, ICASE, SP(100) | YTLW0903 | |
| 104 | C | COMMON BLOCK 5, LENS, IYEAR, IMONTH, IDAY | YTLW0904 | |
| 105 | C | DEFINITION X(1,12), Y(1,12), Z(1,12), D(1,12) | YTLW0905 | |
| 106 | C | DEFINITION H(1,12), P(1,12) | YTLW0906 | |
| 107 | C | DEFINITION MONTH(12) | YTLW0907 | |
| 108 | C | DATA NAME, JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEPT, | YTLW0908 | |
| 109 | C | 1 OCT, NOV, DEC | YTLW0909 | |
| 110 | C | | YTLW0910 | |
| 111 | C | CLEAR THE A,B,C,D ARRAYS BEFORE STARTING SUBROUTINE CALCULATIONS | YTLW0911 | |
| 112 | C | DO 300 H=1,6 | YTLW0912 | |
| 113 | C | DO 400 L=1,12 | YTLW0913 | 2 |
| 114 | C | A(H,L) = 0.0 | YTLW0914 | 3 |
| 115 | C | 400 B(H,L) = 0.0 | YTLW0915 | 4 |
| 116 | C | C(H) = 0.0 | YTLW0916 | 5 |
| 117 | C | 300 D(H) = 0.0 | YTLW0917 | 7 |
| 118 | C | H = 6 | YTLW0918 | 9 |
| 119 | C | FIND THE COMBINED WINDOWS SEPARATELY FOR EACH STATION | YTLW0919 | |
| 120 | C | DO 140 L=1,12 | YTLW0920 | 10 |
| 121 | C | L = MONTH(L) | YTLW0921 | 11 |
| 122 | C | CHECK THE SUN'S FIRST INTERVAL WITH THE OTHER INTERVALS FOR STATION(L) | YTLW0922 | |
| 123 | C | WHEN THE SUN'S SECOND INTERVAL? | YTLW0923 | |
| 124 | C | DO 300 I=1,3 | YTLW0924 | 12 |
| 125 | C | CHECK THE MOON'S FIRST INTERVAL THEN ITS SECOND INTERVAL WITH THE | YTLW0925 | |
| 126 | C | OTHERS FOR STATION(L). | YTLW0926 | |
| 127 | C | DO 300 I=1,3 | YTLW0927 | 13 |
| 128 | C | CHECK THE EARTH SHADOW INTERVALS ONLY IF THEY EXIST FOR THIS DAY? | YTLW0928 | |
| 129 | C | DO 300 I=1,3 | YTLW0929 | 14 |
| 130 | C | IF (I=1,2) GO TO 135 | YTLW0930 | 15 |
| 131 | C | IF (WINDOW(I,1,1) > 0.0) GO TO 136 | YTLW0931 | 16 |
| 132 | C | CHECK THE FIRST, THEN SECOND, THEN THIRD INTERVAL FOR THE TOTAL SKY | YTLW0932 | |
| 133 | C | BRIGHTNESS WITH THE OTHERS FOR STATION(L). | YTLW0933 | |
| 134 | C | DO 300 I=1,3 | YTLW0934 | 21 |
| 135 | C | TEMP(1) = SAHNI(WINDOW(I,1,1), WINDOW(I,4,1)) | YTLW0935 | 22 |
| 136 | C | TEMP(2) = SAHNI(TEMP(1), WINDOW(I,7,1)) | YTLW0936 | 23 |
| 137 | C | TEMP(3) = SAHNI(TEMP(1), WINDOW(I,10,1)) | YTLW0937 | 24 |
| 138 | C | TEMP(4) = SAHNI(WINDOW(I,3,1), WINDOW(I,6,1)) | YTLW0938 | 25 |
| 139 | C | TEMP(5) = SAHNI(TEMP(2), WINDOW(I,9,1)) | YTLW0939 | 26 |
| 140 | C | TEMP(6) = SAHNI(TEMP(3), WINDOW(I,12,1)) | YTLW0940 | 27 |
| 141 | C | IF COMBINED STOP TIME IS LESS THAN COMBINED START TIME FOUND ABOVE | YTLW0941 | |
| 142 | C | WHEN NO INTERSECTION EXISTS, DO NOT EXCEED THESE TIMES IN J1 AND I1 | YTLW0942 | |
| 143 | C | ARRAYS, | YTLW0943 | |
| 144 | C | IF (TEMP(1) > 0.0, TEMP(2)) GO TO 145 | YTLW0944 | 28 |
| 145 | C | STORE INTERVAL INTERSECTIONS IN A AND B ARRAYS AND CHECK FOR ANOTHER | YTLW0945 | |
| 146 | C | INTERVAL FOR STATION (L)? (INCREASE H BY 1) | YTLW0946 | |
| 147 | C | A(H,L) = TEMP(1) | YTLW0947 | 31 |
| 148 | C | B(H,L) = TEMP(2) | YTLW0948 | 32 |
| 149 | C | H = H + 1 | YTLW0949 | 33 |
| 150 | C | 100 CONTINUE | YTLW0950 | 34 |
| 151 | C | 100 CONTINUE | YTLW0951 | 35 |
| 152 | C | 100 CONTINUE | YTLW0952 | 36 |
| 153 | C | 100 CONTINUE | YTLW0953 | 37 |
| 154 | C | ALL POSSIBLE COMBINATIONS OF INTERVALS FOR STATION(L) HAVE BEEN | YTLW0954 | 38 |
| 155 | C | CHECKED, REINITIALIZE H TO 1 AND CHECK NEXT STATION, | YTLW0955 | 39 |
| 156 | C | H = 1 | YTLW0956 | 40 |
| 157 | C | 100 CONTINUE | YTLW0957 | 41 |
| 158 | C | H = 1 | YTLW0958 | 42 |
| 159 | C | DO 510 J=1,6 | YTLW0959 | 43 |
| 160 | C | IF (A(J,1) > 0.0, A(J,2)) GO TO 300 | YTLW0960 | 44 |
| 161 | C | TEMP(1) = SAHNI(1) | YTLW0961</ | |

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| 166 | N | 6N63 | TYLW0266 | 57 |
| 167 | GO TO 510 | | TYLW0267 | 58 |
| 168 | 581 DO 520 J2 01,6 | | TYLW0268 | 59 |
| 169 | IF (A1J2, 2, 1, 60, 2400) GO TO 510 | | TYLW0269 | 60 |
| 170 | TEMP(8) = AHAN1(TEMP11) / PA(J2, 2) | | TYLW0270 | 61 |
| 171 | TEMP(8) = AHAN1(TEMP12) / PB(J2, 2) | | TYLW0271 | 62 |
| 172 | IF (NO, NO, 2) GO TO 521 | | TYLW0272 | 63 |
| 173 | IF (TEMP13) GE TEMP14) GO TO 580 | | TYLW0273 | 64 |
| 174 | C(N) = TEMP(8) | | TYLW0274 | 65 |
| 175 | D(N) = TEMP(8) | | TYLW0275 | 66 |
| 176 | N | 6N63 | TYLW0276 | 67 |
| 177 | GO TO 520 | | TYLW0277 | 68 |
| 178 | 521 DO 580 J3 01,6 | | TYLW0278 | 69 |
| 179 | IF (A1J3, 3, 1, 60, 2400) GO TO 520 | | TYLW0279 | 70 |
| 180 | TEMP(8) = AHAN1(TEMP13) / PA(J3, 3) | | TYLW0280 | 71 |
| 181 | TEMP(8) = AHAN1(TEMP14) / PB(J3, 3) | | TYLW0281 | 72 |
| 182 | IF (NO, NO, 3) GO TO 581 | | TYLW0282 | 73 |
| 183 | IF (TEMP15) GE TEMP16) GO TO 580 | | TYLW0283 | 74 |
| 184 | C(N) = TEMP(8) | | TYLW0284 | 75 |
| 185 | D(N) = TEMP(8) | | TYLW0285 | 76 |
| 186 | N | 6N63 | TYLW0286 | 77 |
| 187 | GO TO 520 | | TYLW0287 | 78 |
| 188 | 521 DO 540 J4 01,6 | | TYLW0288 | 79 |
| 189 | IF (A1J4, 4, 1, 60, 2400) GO TO 520 | | TYLW0289 | 80 |
| 190 | TEMP(8) = AHAN1(TEMP15) / PA(J4, 4) | | TYLW0290 | 81 |
| 191 | TEMP(8) = AHAN1(TEMP16) / PB(J4, 4) | | TYLW0291 | 82 |
| 192 | IF (NO, NO, 4) GO TO 541 | | TYLW0292 | 83 |
| 193 | IF (TEMP17) GE TEMP18) GO TO 580 | | TYLW0293 | 84 |
| 194 | C(N) = TEMP(8) | | TYLW0294 | 85 |
| 195 | D(N) = TEMP(8) | | TYLW0295 | 86 |
| 196 | N | 6N63 | TYLW0296 | 87 |
| 197 | GO TO 540 | | TYLW0297 | 88 |
| 198 | 541 DO 550 J5 01,6 | | TYLW0298 | 89 |
| 199 | IF (A1J5, 5, 1, 60, 2400) GO TO 540 | | TYLW0299 | 90 |
| 200 | TEMP(8) = AHAN1(TEMP17) / PA(J5, 5) | | TYLW0300 | 91 |
| 201 | TEMP(8) = AHAN1(TEMP18) / PB(J5, 5) | | TYLW0301 | 92 |
| 202 | IF (NO, NO, 5) GO TO 551 | | TYLW0302 | 93 |
| 203 | IF (TEMP19) GE TEMP20) GO TO 580 | | TYLW0303 | 94 |
| 204 | C(N) = TEMP(8) | | TYLW0304 | 95 |
| 205 | D(N) = TEMP(8) | | TYLW0305 | 96 |
| 206 | N | 6N63 | TYLW0306 | 97 |
| 207 | GO TO 550 | | TYLW0307 | 98 |
| 208 | 551 DO 560 J6 01,6 | | TYLW0308 | 99 |
| 209 | IF (A1J6, 6, 1, 60, 2400) GO TO 550 | | TYLW0309 | 100 |
| 210 | TEMP(8) = AHAN1(TEMP19) / PA(J6, 6) | | TYLW0310 | 101 |
| 211 | TEMP(8) = AHAN1(TEMP20) / PB(J6, 6) | | TYLW0311 | 102 |
| 212 | IF (NO, NO, 6) GO TO 561 | | TYLW0312 | 103 |
| 213 | IF (TEMP21) GE TEMP22) GO TO 580 | | TYLW0313 | 104 |
| 214 | C(N) = TEMP(8) | | TYLW0314 | 105 |
| 215 | D(N) = TEMP(8) | | TYLW0315 | 106 |
| 216 | N | 6N63 | TYLW0316 | 107 |
| 217 | GO TO 560 | | TYLW0317 | 108 |
| 218 | 561 DO 570 J7 01,6 | | TYLW0318 | 109 |
| 219 | IF (A1J7, 7, 1, 60, 2400) GO TO 560 | | TYLW0319 | 110 |
| 220 | TEMP(8) = AHAN1(TEMP21) / PA(J7, 7) | | TYLW0320 | 111 |
| 221 | TEMP(8) = AHAN1(TEMP22) / PB(J7, 7) | | TYLW0321 | 112 |
| 222 | IF (NO, NO, 7) GO TO 571 | | TYLW0322 | 113 |
| 223 | IF (TEMP23) GE TEMP24) GO TO 580 | | TYLW0323 | 114 |
| 224 | C(N) = TEMP(8) | | TYLW0324 | 115 |
| 225 | D(N) = TEMP(8) | | TYLW0325 | 116 |
| 226 | N | 6N63 | TYLW0326 | 117 |
| 227 | GO TO 570 | | TYLW0327 | 118 |
| 228 | 571 DO 580 J8 01,6 | | TYLW0328 | 119 |
| 229 | IF (A1J8, 8, 1, 60, 2400) GO TO 570 | | TYLW0329 | 120 |
| 230 | TEMP(8) = AHAN1(TEMP23) / PA(J8, 8) | | TYLW0330 | 121 |
| 231 | TEMP(8) = AHAN1(TEMP24) / PB(J8, 8) | | TYLW0331 | 122 |
| 232 | IF (NO, NO, 8) GO TO 581 | | TYLW0332 | 123 |
| 233 | IF (TEMP25) GE TEMP26) GO TO 580 | | TYLW0333 | 124 |
| 234 | C(N) = TEMP(8) | | TYLW0334 | 125 |
| 235 | D(N) = TEMP(8) | | TYLW0335 | 126 |
| 236 | N | 6N63 | TYLW0336 | 127 |
| 237 | GO TO 580 | | TYLW0337 | 128 |
| 238 | 581 DO 590 J9 01,6 | | TYLW0338 | 129 |
| 239 | IF (A1J9, 9, 1, 60, 2400) GO TO 580 | | TYLW0339 | 130 |
| 240 | TEMP(8) = AHAN1(TEMP25) / PA(J9, 9) | | TYLW0340 | 131 |
| 241 | TEMP(8) = AHAN1(TEMP26) / PB(J9, 9) | | TYLW0341 | 132 |
| 242 | IF (NO, NO, 9) GO TO 591 | | TYLW0342 | 133 |
| 243 | IF (TEMP27) GE TEMP28) GO TO 580 | | TYLW0343 | 134 |
| 244 | C(N) = TEMP(8) | | TYLW0344 | 135 |
| 245 | D(N) = TEMP(8) | | TYLW0345 | 136 |
| 246 | N | 6N63 | TYLW0346 | 137 |
| 247 | GO TO 590 | | TYLW0347 | 138 |
| 248 | 591 DO 600 J10 01,6 | | TYLW0348 | 139 |
| 249 | IF (A1J10, 10, 1, 60, 2400) GO TO 590 | | TYLW0349 | 140 |
| 250 | TEMP(8) = AHAN1(TEMP27) / PA(J10, 10) | | TYLW0350 | 141 |
| 251 | TEMP(8) = AHAN1(TEMP28) / PB(J10, 10) | | TYLW0351 | 142 |
| 252 | IF (NO, NO, 10) GO TO 601 | | TYLW0352 | 143 |
| 253 | IF (TEMP29) GE TEMP30) GO TO 580 | | TYLW0353 | 144 |
| 254 | C(N) = TEMP(8) | | TYLW0354 | 145 |
| 255 | D(N) = TEMP(8) | | TYLW0355 | 146 |
| 256 | N | 6N63 | TYLW0356 | 147 |
| 257 | GO TO 600 | | TYLW0357 | 148 |
| 258 | 601 DO 610 J11 01,6 | | TYLW0358 | 149 |
| 259 | IF (A1J11, 11, 1, 60, 2400) GO TO 600 | | TYLW0359 | 150 |
| 260 | TEMP(8) = AHAN1(TEMP29) / PA(J11, 11) | | TYLW0360 | 151 |
| 261 | TEMP(8) = AHAN1(TEMP30) / PB(J11, 11) | | TYLW0361 | 152 |
| 262 | IF (NO, NO, 11) GO TO 611 | | TYLW0362 | 153 |
| 263 | IF (TEMP31) GE TEMP32) GO TO 580 | | TYLW0363 | 154 |
| 264 | C(N) = TEMP(8) | | TYLW0364 | 155 |
| 265 | D(N) = TEMP(8) | | TYLW0365 | 156 |
| 266 | N | 6N63 | TYLW0366 | 157 |
| 267 | GO TO 610 | | TYLW0367 | 158 |
| 268 | 611 DO 620 J12 01,6 | | TYLW0368 | 159 |
| 269 | IF (A1J12, 12, 1, 60, 2400) GO TO 610 | | TYLW0369 | 160 |
| 270 | TEMP(8) = AHAN1(TEMP31) / PA(J12, 12) | | TYLW0370 | 161 |
| 271 | TEMP(8) = AHAN1(TEMP32) / PB(J12, 12) | | TYLW0371 | 162 |
| 272 | IF (NO, NO, 12) GO TO 621 | | TYLW0372 | 163 |
| 273 | IF (TEMP33) GE TEMP34) GO TO 580 | | TYLW0373 | 164 |
| 274 | C(N) = TEMP(8) | | TYLW0374 | 165 |
| 275 | D(N) = TEMP(8) | | TYLW0375 | 166 |
| 276 | N | 6N63 | TYLW0376 | 167 |
| 277 | GO TO 620 | | TYLW0377 | 168 |
| 278 | 621 DO 630 J13 01,6 | | TYLW0378 | 169 |
| 279 | IF (A1J13, 13, 1, 60, 2400) GO TO 620 | | TYLW0379 | 170 |
| 280 | TEMP(8) = AHAN1(TEMP33) / PA(J13, 13) | | TYLW0380 | 171 |
| 281 | TEMP(8) = AHAN1(TEMP34) / PB(J13, 13) | | TYLW0381 | 172 |
| 282 | IF (NO, NO, 13) GO TO 631 | | TYLW0382 | 173 |
| 283 | IF (TEMP35) GE TEMP36) GO TO 580 | | TYLW0383 | 174 |
| 284 | C(N) = TEMP(8) | | TYLW0384 | 175 |
| 285 | D(N) = TEMP(8) | | TYLW0385 | 176 |
| 286 | N | 6N63 | TYLW0386 | 177 |
| 287 | GO TO 630 | | TYLW0387 | 178 |
| 288 | 631 DO 640 J14 01,6 | | TYLW0388 | 179 |
| 289 | IF (A1J14, 14, 1, 60, 2400) GO TO 630 | | TYLW0389 | 180 |
| 290 | TEMP(8) = AHAN1(TEMP35) / PA(J14, 14) | | TYLW0390 | 181 |
| 291 | TEMP(8) = AHAN1(TEMP36) / PB(J14, 14) | | TYLW0391 | 182 |
| 292 | IF (NO, NO, 14) GO TO 641 | | TYLW0392 | 183 |
| 293 | IF (TEMP37) GE TEMP38) GO TO 580 | | TYLW0393 | 184 |
| 294 | C(N) = TEMP(8) | | TYLW0394 | 185 |
| 295 | D(N) = TEMP(8) | | TYLW0395 | 186 |
| 296 | N | 6N63 | TYLW0396 | 187 |
| 297 | GO TO 640 | | TYLW0397 | 188 |
| 298 | 641 DO 650 J15 01,6 | | TYLW0398 | 189 |
| 299 | IF (A1J15, 15, 1, 60, 2400) GO TO 640 | | TYLW0399 | 190 |
| 300 | TEMP(8) = AHAN1(TEMP37) / PA(J15, 15) | | TYLW0400 | 191 |
| 301 | TEMP(8) = AHAN1(TEMP38) / PB(J15, 15) | | TYLW0401 | 192 |
| 302 | IF (NO, NO, 15) GO TO 651 | | TYLW0402 | 193 |
| 303 | IF (TEMP39) GE TEMP40) GO TO 580 | | TYLW0403 | 194 |
| 304 | C(N) = TEMP(8) | | TYLW0404 | 195 |
| 305 | D(N) = TEMP(8) | | TYLW0405 | 196 |
| 306 | N | 6N63 | TYLW0406 | 197 |
| 307 | GO TO 650 | | TYLW0407 | 198 |
| 308 | 651 DO 660 J16 01,6 | | TYLW0408 | 199 |
| 309 | IF (A1J16, 16, 1, 60, 2400) GO TO 650 | | TYLW0409 | 200 |
| 310 | TEMP(8) = AHAN1(TEMP39) / PA(J16, 16) | | TYLW0410 | 201 |
| 311 | TEMP(8) = AHAN1(TEMP40) / PB(J16, 16) | | TYLW0411 | 202 |
| 312 | IF (NO, NO, 16) GO TO 661 | | TYLW0412 | 203 |
| 313 | IF (TEMP41) GE TEMP42) GO TO 580 | | TYLW0413 | 204 |
| 314 | C(N) = TEMP(8) | | TYLW0414 | 205 |
| 315 | D(N) = TEMP(8) | | TYLW0415 | 206 |
| 316 | N | 6N63 | TYLW0416 | 207 |
| 317 | GO TO 660 | | TYLW0417 | 208 |
| 318 | 661 DO 670 J17 01,6 | | TYLW0418 | 209 |
| 319 | IF (A1J17, 17, 1, 60, 2400) GO TO 660 | | TYLW0419 | 210 |
| 320 | TEMP(8) = AHAN1(TEMP41) / PA(J17, 17) | | TYLW0420 | 211 |
| 321 | TEMP(8) = AHAN1(TEMP42) / PB(J17, 17) | | TYLW0421 | 212 |
| 322 | IF (NO, NO, 17) GO TO 671 | | TYLW0422 | 213 |
| 323 | IF (TEMP43) GE TEMP44) GO TO 580 | | TYLW0423 | 214 |
| 324 | C(N) = TEMP(8) | | TYLW0424 | 215 |
| 325 | D(N) = TEMP(8) | | TYLW0425 | 216 |
| 326 | N | 6N63 | TYLW0426 | 217 |
| 327 | GO TO 670 | | TYLW0427 | 218 |
| 328 | 671 DO 680 J18 01,6 | | TYLW0428 | 219 |
| 329 | IF (A1J18, 18, 1, 60, 2400) GO TO 670 | | TYLW0429 | 220 |
| 330 | TEMP(8) = AHAN1(TEMP43) / PA(J18, 18) | | TYLW0430 | 221 |
| 331 | TEMP(8) = AHAN1(TEMP44) / PB(J18, 18) | | TYLW0431 | 222 |
| 332 | IF (NO, NO, 18) GO TO 681 | | TYLW0432 | 223 |
| 333 | IF (TEMP45) GE TEMP46) GO TO 580 | | TYLW0433 | 224 |
| 334 | C(N) = TEMP(8) | | TYLW0434 | 225 |
| 335 | D(N) = TEMP(8) | | TYLW0435 | 226 |
| 336 | N | 6N63 | TYLW0436 | 227 |
| 337 | GO TO 680 | | TYLW0437 | 228 |
| 338 | 681 DO 690 J19 01,6 | | TYLW0438 | 229 |
| 339 | IF (A1J19, 19, 1, 60, 2400) GO TO 680 | | TYLW0439 | 230 |
| 340 | TEMP(8) = AHAN1(TEMP45) / PA(J19, 19) | | TYLW0440 | 231 |
| 341 | TEMP(8) = AHAN1(TEMP46) / PB(J19, 19) | | TYLW0441 | 232 |
| 342 | IF (NO, NO, 19) GO TO 691 | | TYLW0442 | 233 |
| 343 | IF (TEMP47) GE TEMP48) GO TO 580 | | TYLW0443 | 234 |
| 344 | C(N) = TEMP(8) | | TYLW0444 | 235 |
| 345 | D(N) = TEMP(8) | | TYLW0445 | 236 |
| 346 | N | 6N63 | TYLW0446 | 237 |
| 347 | GO TO 690 | | TYLW0447 | 238 |
| 348 | 691 DO 700 J20 01,6 | | TYLW0448 | 239 |
| 349 | IF (A1J20, 20, 1, 60, 2400) GO TO 690 | | TYLW0449 | 240 |
| 350 | TEMP(8) = AHAN1(TEMP47) / PA(J20, 20) | | TYLW0450 | 241 |
| 351 | TEMP(8) = AHAN1(TEMP48) / PB(J20, 20) | | TYLW0451 | 242 |
| 352 | IF (NO, NO, 20) GO TO 701 | | TYLW0452 | 243 |
| 353 | IF (TEMP49) GE TEMP50) GO TO 580 | | TYLW0453 | 244 |
| 354 | C(N) = TEMP(8) | | TYLW0454 | 245 |
| 355 | D(N) = TEMP(8) | | TYLW0455 | 246 |
| 356 | N | 6N63 | TYLW0456 | 247 |
| 357 | GO TO 700 | | TYLW0457 | 248 |
| 358 | 701 DO 710 J21 01,6 | | TYLW0458 | 249 |
| 359 | IF (A1J21, 21, 1, 60, 2400) GO TO 700 | | TYLW0459 | 250 |
| 360 | TEMP(8) = AHAN1(TEMP49) / PA(J21, 21) | | TYLW0460 | 251 |
| 361 | TEMP(8) = AHAN1(TEMP50) / PB(J21, 21) | | TYLW0461 | 252 |
| 362 | IF (NO, NO, 21) GO TO 711 | | TYLW0462 | 253 |
| 363 | IF (TEMP51) GE TEMP52) GO TO 580 | | TYLW0463 | 254 |
| 364 | C(N) = TEMP(8) | | TYLW0464 | 255 |
| 365 | D(N) = TEMP(8) | | TYLW0465 | 256 |
| 366 | N | 6N63 | TYLW0466 | 257 |
| 367 | GO TO 710 | | TYLW0467 | 258 |
| 368 | 711 DO 720 J22 01,6 | | TYLW0468 | 259 |
| 369 | IF (A1J22, 22, 1, 60, 2400) GO TO 710 | | TYLW0469 | 260 |
| 370 | TEMP(8) = AHAN1(TEMP51) / PA(J22, 22) | | TYLW0470 | 261 |
| 371 | TEMP(8) = AHAN1(TEMP52) / PB(J22, 22) | | TYLW0471 | 262 |
| 372 | IF (NO, NO, 22) GO TO 721 | | TYLW0472 | 263 |
| 373 | IF (TEMP53) GE TEMP54) GO TO 580 | | TYLW0473 | 264 |
| 374 | C(N) = TEMP(8) | | TYLW0474 | 265 |
| 375 | D(N) = TEMP(8) | | TYLW0475 | 266 |
| 376 | N | 6N63 | TYLW0476 | 267 |
| 377 | GO TO 720 | | TYLW0477 | 268 |
| 378 | 721 DO 730 J23 01,6 | | TYLW0478 | 269 |
| 379 | IF (A1J23, 23, 1, 60, 2400) GO TO 720 | | TYLW0479 | 270 |
| 380 | TEMP(8) = AHAN1(TEMP53) / PA(J23, 23) | | TYLW0480 | 271 |
| 381 | TEMP(8) = AHAN1(TEMP54) / PB(J23, 23) | | TYLW0481 | 272 |
| 382 | IF (NO, NO, 23) GO TO 731 | | TYLW0482 | 273 |
| 383 | IF (TEMP55) GE TEMP56) GO TO 580 | | TYLW0483 | 274 |
| 384 | C(N) = TEMP(8) | | TYLW0484 | 275 |

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| 239 | IF (A1J9,X2,Y0,24,0) GO TO 500 | TTLW0239 | 272 |
| 240 | TEMP(17)SAHAR1(TEMP(15)SA1J9,X2,Y0) | TTLW0240 | 273 |
| 241 | TEMP(20)AHINI1(TEMP(18)AH1J9,X2,Y0) | TTLW0241 | 274 |
| 242 | IF (M0,M0,X0) GO TO 502 | TTLW0242 | 277 |
| 243 | IF (TEMP(17),M0,TEMP(18))GO TO 500 | TTLW0243 | 280 |
| 244 | C(M) 5YHNR(17) | TTLW0244 | 283 |
| 245 | D(M) 5YHNR(18) | TTLW0245 | 284 |
| 246 | N 5N02 | TTLW0246 | 285 |
| 247 | GO TO 500 | TTLW0247 | 286 |
| 248 | 500 DO 600 J00,256 | TTLW0248 | 287 |
| 249 | IF (A1J10,X2,Y0,24,0) GO TO 500 | TTLW0249 | 288 |
| 250 | TEMP(20)SAHAR1(TEMP(17)PA(J00,10)) | TTLW0250 | 291 |
| 251 | TEMP(23)AHINI1(TEMP(20)PA(J00,10)) | TTLW0251 | 292 |
| 252 | IF (M0,M0,X0) GO TO 602 | TTLW0252 | 293 |
| 253 | IF (TEMP(17),M0,TEMP(20))GO TO 600 | TTLW0253 | 296 |
| 254 | C(M) 5YHNR(19) | TTLW0254 | 299 |
| 255 | D(M) 5YHNR(20) | TTLW0255 | 300 |
| 256 | N 5N02 | TTLW0256 | 301 |
| 257 | GO TO 600 | TTLW0257 | 302 |
| 258 | 600 DO 620 J01,136 | TTLW0258 | 303 |
| 259 | IF (A1J11,X2,Y0,24,0) GO TO 600 | TTLW0259 | 304 |
| 260 | TEMP(21)SAHAR1(TEMP(19)PA(J01,11)) | TTLW0260 | 307 |
| 261 | TEMP(24)AHINI1(TEMP(21)PA(J01,11)) | TTLW0261 | 308 |
| 262 | IF (M0,M0,X0) GO TO 612 | TTLW0262 | 309 |
| 263 | IF (TEMP(21),M0,TEMP(24))GO TO 620 | TTLW0263 | 312 |
| 264 | C(M) 5YHNR(21) | TTLW0264 | 315 |
| 265 | D(M) 5YHNR(22) | TTLW0265 | 316 |
| 266 | N 5N02 | TTLW0266 | 317 |
| 267 | GO TO 620 | TTLW0267 | 318 |
| 268 | 612 DO 620 J12,136 | TTLW0268 | 319 |
| 269 | IF (A1J12,X2,Y0,24,0) GO TO 610 | TTLW0269 | 320 |
| 270 | TEMP(25)SAHAR1(TEMP(21)PA(J02,12)) | TTLW0270 | 323 |
| 271 | TEMP(28)AHINI1(TEMP(22)PA(J02,12)) | TTLW0271 | 324 |
| 272 | IF (TEMP(21),M0,TEMP(24))GO TO 620 | TTLW0272 | 325 |
| 273 | C(M) 5YHNR(23) | TTLW0273 | 328 |
| 274 | D(M) 5YHNR(24) | TTLW0274 | 329 |
| 275 | N 5N02 | TTLW0275 | 330 |
| 276 | 620 CONTINUE | TTLW0276 | 331 |
| 277 | 620 CONTINUE | TTLW0277 | 333 |
| 278 | 680 CONTINUE | TTLW0278 | 335 |
| 279 | 500 CONTINUE | TTLW0279 | 337 |
| 280 | 580 CONTINUE | TTLW0280 | 339 |
| 281 | 590 CONTINUE | TTLW0281 | 341 |
| 282 | 560 CONTINUE | TTLW0282 | 343 |
| 283 | 550 CONTINUE | TTLW0283 | 345 |
| 284 | 540 CONTINUE | TTLW0284 | 347 |
| 285 | 530 CONTINUE | TTLW0285 | 349 |
| 286 | 520 CONTINUE | TTLW0286 | 351 |
| 287 | 510 CONTINUE | TTLW0287 | 353 |
| 288 | C REMIND TEMPORARY FILES IF THIS IS THE FIRST DAY | TTLW0288 | |
| 289 | 289 IF (1,M0,NDPJ0) GO TO 310 | TTLW0289 | 355 |
| 290 | REMIND 10 | TTLW0290 | 358 |
| 291 | REMIND 10 | TTLW0291 | 359 |
| 292 | 210 CALL SCAL (C,DVE,F,1) | TTLW0292 | 360 |
| 293 | C IF MORE VALUES TO FOLLOW DO NOT WRITE OUTPUT ON FILE 09. | TTLW0293 | |
| 294 | IF (FINAL,0) RETURN | TTLW0294 | 361 |
| 295 | WRITE (V11000)0JUL,(DAY,MONTH,MYMONTH),1YEAR,IN(1),P(1),10100 | TTLW0295 | 364 |
| 296 | RETURN | TTLW0296 | 370 |
| 297 | 2000 FORMAT (F10,2,12,A3,14/912F10,5) | TTLW0297 | 371 |
| 298 | END | TTLW0298 | 371 |

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(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)
0# E      DOES NOT ANPBAR IS READI DATA/ CORRON OR LEFT OF EQUALS (?)
(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)

```

DOES NOT APPEAR IN READ, DATA, COMMON OR LEFT OF EQUALS (R)

67906 02 09-25-72 12,262 COMBINED WINDOW INTERVAL

*****SUBROUTINE TVLWDG*****

WHEPAGE

PROGRAM BREAK 2345

COMMON LENGTH 8

Y COUNT DIVS 5

PRIMARY SYNDOP 02YRV

TVLWDG 8

SECONDARY SYNDOP 02YRV

BLOCK LENGTH

1 BLN51 8

2 BLN2 15

3 BLN4 528

4 BLN3 8

5 BLN9 4

SYNREF

6 ISSU

7 ,PENV,

10 ,PES1,

11 ,PENV,

12 ,PENV,

2345 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JMDA 050178/052571 JMRB 050171/052571 JMPC 050175/052571

THERE WERE 00 WARNING FLAGS IN THE ABOVE ASSEMBLY

04 20138 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY.

67906 02 09-25-72 12,262 TEMPORARY STORAGE OF FILE 9 DATA

TEMPORARY FILE 9 DATA*****

| | | | |
|----|-------|---|----------|
| 1 | CICCS | TEMPORARY STORAGE OF FILE 9 DATA | ICAS0001 |
| 2 | C | *****TEMPORARY FILE 9 DATA***** | ICAS0002 |
| 3 | C | | ICAS0003 |
| 4 | C | *****START OF DOCUMENTATION CARDS***** | ICAS0004 |
| 5 | C | | ICAS0005 |
| 6 | C | *****NAGA WALLER'S VERSION OF 052571 | ICAS0006 |
| 7 | C | | ICAS0007 |
| 8 | C | *****LANGUAGE-FORTRAN 14 | ICAS0008 |
| 9 | C | | ICAS0009 |
| 10 | C | *****MACHINE-05 025 | ICAS0010 |
| 11 | C | | ICAS0011 |
| 12 | C | *****PURPOSE- | ICAS0012 |
| 13 | C | TO CALCULATE A COMBINED RELEASE WINDOW FOR VARIOUS RELEASE | ICAS0013 |
| 14 | C | POINTS AND/OR DERIVED PROBLEM CONSTRAINTS (EXCLUDING THE SUN | ICAS0014 |
| 15 | C | AND MOON CONSTRAINTS). | ICAS0015 |
| 16 | C | | ICAS0016 |
| 17 | C | *****METHOD- | ICAS0017 |
| 18 | C | THE MOST RECENT COMBINED RELEASE WINDOW CALCULATED BY | ICAS0018 |
| 19 | C | SUBROUTINE TVLWDG IS COMBINED WITH THOSE OF PRIOR RUN CASES | ICAS0019 |
| 20 | C | WITHIN THIS JOB, FOR THE FIRST CASE THE WINDOW IS ONLY RECORDED | ICAS0020 |
| 21 | C | ON THE TEMPORARY FILE 17 JULIAN DATES ARE CHECKED TO INSURE | ICAS0021 |
| 22 | C | COMPATIBILITY. | ICAS0022 |
| 23 | C | | ICAS0023 |
| 24 | C | *****INPUT- | ICAS0024 |
| 25 | C | | ICAS0025 |
| 26 | C | DOUL -JULIAN DATE FOR CURRENT DATE, | ICAS0026 |
| 27 | C | | ICAS0027 |
| 28 | C | C(6) -ARRAY OF MOST RECENT CASE OF COMBINED WINDOW | ICAS0028 |
| 29 | C | -ARRAY TIMES FOR CURRENT DATE, | ICAS0029 |
| 30 | C | | ICAS0030 |
| 31 | C | D(6) -ARRAY OF MOST RECENT CASE OF COMBINED WINDOW | ICAS0031 |

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32 C -OVER TIME FOR CURRENT DATE, ICAS0032
33 C ICAS0033
34 C 10000 -CASE NUMBER ICAS0034
35 C ICAS0035
36 C 1000 -CURRENT NUMBER OF DAYS FROM FIRST DAY CALCULATED ICAS0036
37 C ICAS0037
38 C ICAS0038
39 C ***** ICAS0039
40 C ICAS0040
41 C A(0) -ARRAY OF TOTAL CASES SO FAR CALCULATED OF ICAS0041
42 C -COMBINED WINDOW START TIMES FOR CURRENT DATE, ICAS0042
43 C ICAS0043
44 C B(0) -ARRAY OF TOTAL CASES SO FAR CALCULATED OF ICAS0044
45 C -COMBINED WINDOW STOP TIMES FOR CURRENT DATE, ICAS0045
46 C ICAS0046
47 C ***** ICAS0047
48 C ONLY THOSE CONSTRAINTS CURRENTLY DEFINED IN THE WINDOW ICAS0048
49 C COMPUTER PROGRAM CAN BE RUNNED. ICAS0049
50 C ICAS0050
51 C ***** ICAS0051
52 C NONE ICAS0052
53 C ICAS0053
54 C ***** OF DOCUMENTATION CARDS ***** ICAS0054
55 C ICAS0055
56 C SHORTLINE DEAS (C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z) ICAS0056
57 C COMMON/BLK1, 0JULY, N0000, N0000, N0000, N0000 ICAS0057
58 C COMMON/BLK2, ICASE, IFINAL ICAS0058
59 C DIMENSION R(4), D(0), A(0), B(0), TEMP(54) ICAS0059
60 C ICAS0060
61 C IF (JCASE=0) GO TO 25 ICAS0061
62 C IF (IDAY=0, N0000) GO TO 25 ICAS0062
63 C COMPUTE PROPER FILES FOR INPUT AND OUTPUT FOR FIRST DAY OF THIS CASE, ICAS0063
64 C IF (JCASE) 25, 22, 21 ICAS0064
65 21 ICM 55 ICAS0065
66 IOUT 55 ICAS0066
67 GO TO 25 ICAS0067
68 22 ICM 55 ICAS0068
69 IOUT 55 ICAS0069
70 23 READ (11, 1000) 7JULY, 75HR(1), 75HR(2) ICAS0070
71 C READ COMBINED WINDOW FROM PRIOR CASES AND CHECK JULIAN DATE ICAS0071
72 C IF (7JULY=0, 7JULY) GO TO 12 ICAS0072
73 C INCLUDE RESULTS OF LATEST CASE WITH COMBINED WINDOW ICAS0073
74 N 45 ICAS0074
75 DO 100 161, 21, 2 ICAS0075
76 DO 200 162, 6 ICAS0076
77 IF (0.1, 0.2, 24.0) GO TO 100 ICAS0077
78 TEMP(23) = MAX1(TEMP(1), 0.1) ICAS0078
79 TEMP(24) = MIN1(TEMP(1), 0.1) ICAS0079
80 IF (TEMP(23) > 0.1, TEMP(24) < 0.1) GO TO 200 ICAS0080
81 C GOOD TIME INTERVAL FOR WINDOW ICAS0081
82 A(0) = 0.1 ICAS0082
83 B(0) = 0.1 ICAS0083
84 N 45 ICAS0084
85 200 CONTINUE ICAS0085
86 100 CONTINUE ICAS0086
87 C FILL REMAINDER OF A AND B ARRAYS WITH 20.0 AND 0.1 RESPECTIVELY, ICAS0087
88 IF (N, 20.0) GO TO 15 ICAS0088
89 15 DO 300 N, 20.0 ICAS0089
90 A(N) = 20.0 ICAS0090
91 300 B(N) = 0.1 ICAS0091
92 C WRITE LATEST COMBINED RELEASE WINDOW ON PROPER TEMPORARY FILE, ICAS0092
93 15 WRITE (1OUT, 1000) 0JULY, A(1), B(1), 0.1 ICAS0093
94 C CHANGE FILE DESIGNATION WHEN IF WINDOW COMPLETED FOR LAST DAY, ICAS0094
95 IF (IDAY=0, N0000) FILE = NEXT(1000000) ICAS0095
96 RETURN ICAS0096
97 C COPY DATA ONTO FILE 13 IF THIS IS FIRST CASE, ICAS0097
98 15 IF 13 ICAS0098
99 IOUT 55 ICAS0099
100 DO 400 163, 6 ICAS0100
101 A(1) = 0.1 ICAS0101
102 400 B(1) = 0.1 ICAS0102
103 GO TO 15 ICAS0103
104 C PRINT - WINDOW ON JULIAN DATE CHECK: ***** MESSAGE - TERMINATE PROGRAM, ICAS0104

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| | | | |
|-----|--|----------|----|
| 105 | SE HWY5 (033000) ICASB | ICAS0005 | 64 |
| 106 | 0000 FORMAT (IEN,2,12F10.5) | ICAS0006 | 67 |
| 107 | 0002 FORMAT (I20,10.00 F10.4,ERR0R- DATES DO NOT MEYSH FOR WINDON CALCOL | ICAS0007 | 67 |
| 108 | 1AYONS UONG CASE,IS,250-PROG00AH T00HNAVED 0000, | ICAS0008 | |
| 109 | STOP | ICAS0009 | 67 |
| 110 | END | ICAS0010 | 68 |

28007 WORDS OF MEMORY USED BY THIS COMPIATION

07006 DE 09-25-72 13,273 TEMPORARY STORAGE OF FILE 9 DATA

TEMPORARY FILE 9 DATA*****

PREFACE

PROGRAM BREAK 410
COMMON LENGTH 8
Y CHONY GIVE 5

PRIMARY SYNDIC ENTRY

1000 0

SECONDARY SYNDIC ENTRY

BLOCK LENGTH

1 BLK01 4
2 BLK02 8

SUMMARY

3 .P00V.
4 .P00V.
5 .P00V.
6 .P00V.
7 .P00V.
10 .P00V.

410 IS THE NEXT AVAILABLE LOCATION

CHAP VERSION/REVISION/DATE JMW 050171/052571 JMW 050171/052571 JMW 050171/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
46 28429 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY

07006 DE 09-25-72 13,273 PRINT OUTPUT SUBROUTINE

| | | | |
|----|-------|--|----------|
| 1 | CHUV2 | PRINT OUTPUT SUBROUTINE | OUT20001 |
| 2 | CHUV2 | PRINT OUTPUT SUBROUTINE | OUT20002 |
| 3 | C | | OUT20003 |
| 4 | C | EVERY OK DOCUMENTATION CARD | OUT20004 |
| 5 | C | | OUT20005 |
| 6 | C | CHAGA HALCPN VERSION OF 02/01/70 | OUT20006 |
| 7 | C | | OUT20007 |
| 8 | C | LABOUR-PORTAN IV | OUT20008 |
| 9 | C | | OUT20009 |
| 10 | C | THEME-05 025 | OUT20010 |
| 11 | C | | OUT20011 |
| 12 | C | THEME- | OUT20012 |
| 13 | C | TO UTILIZE THE PROPER SUBROUTINE FOR OUTPUT PRINTING AND/OR | OUT20013 |
| 14 | C | PRINTING FOR THE TIME PERIOD AS REQUESTED ON INPUT CARD IN | OUT20014 |
| 15 | C | | OUT20015 |
| 16 | C | THEME- | OUT20016 |
| 17 | C | THIS SUBROUTINE CALCULATES THE JULIAN DATE FOR THOSE DATES | OUT20017 |
| 18 | C | REQUESTED FOR PRINTING AND/OR PLOTTING, IT THEN CALLS THE PROPER | OUT20018 |
| 19 | C | SUBROUTINES TO EXECUTE THE PRINTING AND/OR PLOTTING AS | OUT20019 |
| 20 | C | REQUESTED, IF NO PRINTING OR PLOTTING IS DESIRED THEN THE | OUT20020 |
| 21 | C | SUBROUTINE TERMINATES AFTER FINDING THE JULIAN DATES DESIRED | OUT20021 |
| 22 | C | ABOVE. | OUT20022 |
| 23 | C | | OUT20023 |

| | | | | |
|----|---|---|---|----------|
| 24 | C | *****INPUT* | | OUT20024 |
| 25 | C | | | OUT20025 |
| 26 | C | KMB | -MONTH PLOTTING AND/OR PRINTING TO BEGIN | OUT20026 |
| 27 | C | | | OUT20027 |
| 28 | C | KDB | -DAY PLOTTING AND/OR PRINTING TO BEGIN | OUT20028 |
| 29 | C | | | OUT20029 |
| 30 | C | KYR | -YEAR PLOTTING AND/OR PRINTING TO BEGIN | OUT20030 |
| 31 | C | | | OUT20031 |
| 32 | C | LMB | -MONTH PLOTTING AND/OR PRINTING TO END | OUT20032 |
| 33 | C | | | OUT20033 |
| 34 | C | LDB | -DAY PLOTTING AND/OR PRINTING TO END | OUT20034 |
| 35 | C | | | OUT20035 |
| 36 | C | LYR | -YEAR PLOTTING AND/OR PRINTING TO END | OUT20036 |
| 37 | C | | | OUT20037 |
| 38 | C | INRT7 | -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 07 | OUT20038 |
| 39 | C | | -DATA | OUT20039 |
| 40 | C | | -00: PRINT FILE 07 DATA | OUT20040 |
| 41 | C | | -01: DO NOT PRINT FILE 07 DATA | OUT20041 |
| 42 | C | | | OUT20042 |
| 43 | C | INRT9 | -INTEGER CODE TO SIGNAL REQUEST PRINTING FILE 09 | OUT20043 |
| 44 | C | | -DATA | OUT20044 |
| 45 | C | | -00: PRINT FILE 09 DATA | OUT20045 |
| 46 | C | | -01: DO NOT PRINT FILE 09 DATA | OUT20046 |
| 47 | C | | | OUT20047 |
| 48 | C | IPLOT | -INTEGER CODE TO SIGNAL REQUEST PLOTTING DATA | OUT20048 |
| 49 | C | | -00: CREATE A FILE FOR PLOTTING DATA FOR 1 | OUT20049 |
| 50 | C | | -01: CALENDAR YEAR THROUGH FILE 01 AT 556 BP1 | OUT20050 |
| 51 | C | | -02: CREATE A FILE FOR PLOTTING DATA FOR 2 | OUT20051 |
| 52 | C | | -03: CALENDAR MONTH THROUGH FILE 01 AT 556 BP1 | OUT20052 |
| 53 | C | | -04: DO NOT CREATE A PLOT FILE | OUT20053 |
| 54 | C | | | OUT20054 |
| 55 | C | IBASE | -BASE NUMBER | OUT20055 |
| 56 | C | | | OUT20056 |
| 57 | C | | | OUT20057 |
| 58 | C | *****OUTPUT* | | OUT20058 |
| 59 | C | | | OUT20059 |
| 60 | C | BEGIN | -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING | OUT20060 |
| 61 | C | | | OUT20061 |
| 62 | C | FINIS | -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING | OUT20062 |
| 63 | C | | | OUT20063 |
| 64 | C | LINE | -LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT | OUT20064 |
| 65 | C | | -HEADING | OUT20065 |
| 66 | C | | | OUT20066 |
| 67 | C | *****RESTRICTIONS* | | OUT20067 |
| 68 | C | | THIS SUBROUTINE REQUIRES THE EXISTENCE OF FILES 07 AND 09 AND | OUT20068 |
| 69 | C | | IF EITHER IS TO BE USED WHEN THE DATA MUST EXIST FOR THESE | OUT20069 |
| 70 | C | | DATES REQUESTED, | OUT20070 |
| 71 | C | | | OUT20071 |
| 72 | C | *****SUBPROGRAMS REQUIRED* | | OUT20072 |
| 73 | C | DAVNUM | | OUT20073 |
| 74 | C | OUTYPR | | OUT20074 |
| 75 | C | TYLPR | | OUT20075 |
| 76 | C | PLVRYN | | OUT20076 |
| 77 | C | | | OUT20077 |
| 78 | C | *****END OF DOCUMENTATION CARDS***** | | OUT20078 |
| 79 | C | | | OUT20079 |
| 80 | | SUBROUTINE OUT2 | | OUT20080 |
| 81 | | COMMON/BLK1 /KMONTH,KDAY ,KYEAR ,LMONTH,LDAY ,LYEAR ,KNO2,KDA , | | OUT20081 |
| 82 | | 1 KYR, LMO2,LDA, LLYR, ICBLC, INRT7, INRT9, IPRT7,IPLOT | | OUT20082 |
| 83 | | COMMON/BLK2/BEGIN, FINIS | | OUT20083 |
| 84 | | COMMON/BLK3 /IBASE,IPVAL | | OUT20084 |
| 85 | C | FIND THE JULIAN DATE FOR THE BEGINNING AND ENDING DATES ASKED TO BE | | OUT20085 |
| 86 | C | PRINTED AND/OR PLOTTED. | | OUT20086 |
| 87 | | DAY GKDA | | OUT20087 |
| 88 | | YEAR GKYR | | OUT20088 |
| 89 | | BEGIN DAYNUM (KMB, DAY, YEAR) | | OUT20089 |
| 90 | | DAY GLDA | | OUT20090 |
| 91 | | YEAR GLYR | | OUT20091 |
| 92 | | FINIS DAYNUM (LMB, DAY, YEAR) | | OUT20092 |
| 93 | C | PRINT DATA FOR DAILY RELEASE TIMES ARE CONSTRAINT PER STATION ONLY IF | | OUT20093 |
| 94 | C | IPRT7 = 0 | | OUT20094 |

| | | | |
|-----|--|----------|----|
| 95 | IF (INVTY,NO,1) GO TO 10 | OUT20095 | 7 |
| 96 | DO 100 101,102,103,104,105 | OUT20096 | 10 |
| 97 | WRITE (6,1000) I | OUT20097 | 11 |
| 98 | LINE 65 | OUT20098 | 14 |
| 99 | CALL OUTPR (LINE) | OUT20099 | 15 |
| 100 | 100 CONTINUE | OUT20100 | 16 |
| 101 | C PRINT OUT DATA FOR COMBINED DAILY RELEASE TIMES ONLY IF INVTY < 0 | OUT20101 | |
| 102 | GO IF (INVTY,NO,1) GO TO 10 | OUT20102 | 16 |
| 103 | WRITE (6,1001) | OUT20103 | 21 |
| 104 | LINE 65 | OUT20104 | 23 |
| 105 | CALL VTYPE (LINE) | OUT20105 | 24 |
| 106 | C CREATE A TAPE OF THE COMBINED RELEASE WINDOWS FOR PLOTTING ON THE | OUT20106 | |
| 107 | C CALENDAR YEAR GRID IF PLOT=0, AND ON THE CALENDAR MONTH IF | OUT20107 | |
| 108 | C PLOT=1 ONLY | OUT20108 | |
| 109 | GO IF (PLOT-1) 21,22,23 | OUT20109 | 25 |
| 110 | GO CALL PLYTN | OUT20110 | 26 |
| 111 | RETURN | OUT20111 | 27 |
| 112 | GO CALL HOPLY | OUT20112 | 28 |
| 113 | GO RETURN | OUT20113 | 29 |
| 114 | 2000 FORMAT (1M,20XV72H0000RELEASE WINDOW DAILY TIME INTERVALS PER CONDUT20114 | OUT20114 | 30 |
| 115 | 1STATION PER STATIONNO,000,100,00000 NO,012/10 | OUT20115 | |
| 116 | 1 4X,4NDAYS,10N718HCONSTRAINT99, | OUT20116 | |
| 117 | 2 7HSTATION, 9X, 5(5HSTARY9X94MSOP.VR)/, | OUT20117 | |
| 118 | 3 9X, 6(3X,6HHR/H10,3X)} | OUT20118 | |
| 119 | 2001 FORMAT (1M,20X,51H0000DAILY RELEASE WINDOW DAILY TIME INTERVALS,OUT20119 | OUT20119 | 30 |
| 120 | 1000/1,9X,4NDAYS,9X, 6(5HSTARY,3X,4HSTOR,4X)P,16X,12(6HHR/H10,2X) | OUT20120 | |
| 121 | 2/1} | OUT20121 | |
| 122 | 2002 FORMAT (2 11X,12,1X,12,9X,1X)} | OUT20122 | 30 |
| 123 | END | OUT20123 | 30 |

23087 WORDS OF MEMORY USED BY THIS COMPLETION

| | | | |
|----------|----------|--------|-------------------------|
| 67906 02 | 09-25-72 | 12,255 | PRINT OUTPUT SUBROUTINE |
|----------|----------|--------|-------------------------|

*****ROUTINE BUY*****

PREFACE

PROGRAM HUNGAR 240

COMMON LENGTH 6

SAVING GRANTS

~~PRIMARU SYNDUF ENYRU~~

OVER

SECONDARY SYNDROME ENTRY

| BLANK | LENGTH |
|-------|--------|
| 1 | 10 |
| 2 | 10 |
| 3 | 10 |
| 4 | 10 |
| 5 | 10 |
| 6 | 10 |
| 7 | 10 |
| 8 | 10 |
| 9 | 10 |
| 10 | 10 |
| 11 | 10 |
| 12 | 10 |
| 13 | 10 |
| 14 | 10 |
| 15 | 10 |
| 16 | 10 |
| 17 | 10 |
| 18 | 10 |
| 19 | 10 |
| 20 | 10 |
| 21 | 10 |
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| 23 | 10 |
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| 85 | 10 |
| 86 | 10 |
| 87 | 10 |
| 88 | 10 |
| 89 | 10 |
| 90 | 10 |
| 91 | 10 |
| 92 | 10 |
| 93 | 10 |
| 94 | 10 |
| 95 | 10 |
| 96 | 10 |
| 97 | 10 |
| 98 | 10 |
| 99 | 10 |
| 100 | 10 |

1 SLNB 28

2 BLNG2 2

3 BLK5 2

SUMMARY

~~4 MONEY~~

5 DAYNUM

6 : PMV.

7. RESULTS

10 : FORD,

11 OUYVPE

12 PLVRYM

13 YVVP

267 13 YN
AR VERBOKER

6U 19389 HARDS OF BRASSY WERE USED W/ SHAP FOR THIS ASSEMBLY?

67906 02 09-25-72 12,283 FILE 07 DATA

PRINT ROUTINE FOR FILE 07 DATA*****

| | | | | |
|----|---|--|--|----------|
| 1 | C | CUVY | FILE 07 DATA | OUTT0001 |
| 2 | C | *****PRINT ROUTINE FOR FILE 07 DATA***** | | OUTT0002 |
| 3 | C | | | OUTT0003 |
| 4 | C | *****START OF DOCUMENTATION CARDS***** | | OUTT0004 |
| 5 | C | | | OUTT0005 |
| 6 | C | *****NASK MACROPS VERSION OF 02X052Y0 | | OUTT0006 |
| 7 | C | | | OUTT0007 |
| 8 | C | *****LANGUAGE-FORTRAN IV | | OUTT0008 |
| 9 | C | | | OUTT0009 |
| 10 | C | *****MACHINE-GE 625 | | OUTT0010 |
| 11 | C | | | OUTT0011 |
| 12 | C | *****PURPOSE- | | OUTT0012 |
| 13 | C | TO PRINT THE DAILY RELEASE WINDOW DATA FOR EACH CONSTRAINT AND | | OUTT0013 |
| 14 | C | FOR EACH STATION. | | OUTT0014 |
| 15 | C | | | OUTT0015 |
| 16 | C | *****METHOD- | | OUTT0016 |
| 17 | C | THE DAILY RELEASE WINDOW TIMES CALCULATED FOR EACH STATION AND | | OUTT0017 |
| 18 | C | EACH CONSTRAINT STORED ON FILE 07 IS FIRST READ BY THIS | | OUTT0018 |
| 19 | C | SUBROUTINE, THE DATA IS THEN PRINTED IN HOURS AND MINUTES FOR | | OUTT0019 |
| 20 | C | THOSE DAYS WITHIN JULIAN DATES 'BEGIN' AND 'FINIS', THE DATE, | | OUTT0020 |
| 21 | C | CONSTRAINT NAME AND STATION NAME ARE PRINTED ALONG WITH THE | | OUTT0021 |
| 22 | C | TIME INTERVALS IN VARIED FORMATS, THIS PROGRAM WILL TERMINATE IF | | OUTT0022 |
| 23 | C | THE JULIAN DATE OF THE CURRENT TAPE RECORD BEING READ IS EITHER | | OUTT0023 |
| 24 | C | GREATER THAN 'FINIS' OR EQUAL TO 99970. | | OUTT0024 |
| 25 | C | | | OUTT0025 |
| 26 | C | *****INPUT- | | OUTT0026 |
| 27 | C | ON FILE 07 | | OUTT0027 |
| 28 | C | | | OUTT0028 |
| 29 | C | LINE | -LINE COUNT USED TO SKIP TO NEW PAGE AND PRINT | OUTT0029 |
| 30 | C | | -HEADING | OUTT0030 |
| 31 | C | | | OUTT0031 |
| 32 | C | BEGIN | -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING | OUTT0032 |
| 33 | C | | | OUTT0033 |
| 34 | C | FINIS | -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING | OUTT0034 |
| 35 | C | | | OUTT0035 |
| 36 | C | BJUL | -JULIAN DATE FOR CURRENT DATA | OUTT0036 |
| 37 | C | | | OUTT0037 |
| 38 | C | K | -INDEX FOR CONSTRAINTS | OUTT0038 |
| 39 | C | | -01, EARTH SHADOW | OUTT0039 |
| 40 | C | | -02, NOT USED | OUTT0040 |
| 41 | C | | -03, SUN | OUTT0041 |
| 42 | C | | -04, MOON | OUTT0042 |
| 43 | C | | -05, TOTAL SKY BACKGROUND BRIGHTNESS | OUTT0043 |
| 44 | C | | | OUTT0044 |
| 45 | C | IDAY | -DAY NUMBER FOR DATE OF CURRENT DATA | OUTT0045 |
| 46 | C | | | OUTT0046 |
| 47 | C | IMONTH | -MONTH FOR DATE OF CURRENT DATA | OUTT0047 |
| 48 | C | | | OUTT0048 |
| 49 | C | IYEAR | -YEAR FOR DATE OF CURRENT DATA | OUTT0049 |
| 50 | C | | | OUTT0050 |
| 51 | C | NRSTR(3) | -ALPHANUMERIC NAME OF CONSTRAINT | OUTT0051 |
| 52 | C | | | OUTT0052 |
| 53 | C | NAME(3,32) | -NAME OF TRACKING STATIONS USED | OUTT0053 |
| 54 | C | | | OUTT0054 |
| 55 | C | WINDOW(6) | -THE DAILY RELEASE WINDOW START/STOP TIMES, | OUTT0055 |
| 56 | C | | -1ST INDEX FOR STARTING START/STOP TIMES, | OUTT0056 |
| 57 | C | | -1,375 FOR START TIMES | OUTT0057 |
| 58 | C | | -2,475 FOR STOP TIMES | OUTT0058 |
| 59 | C | | | OUTT0059 |
| 60 | C | | | OUTT0060 |
| 61 | C | *****OUTPUT- | | OUTT0061 |
| 62 | C | ON FILE 06-PRINTER | | OUTT0062 |
| 63 | C | | | OUTT0063 |
| 64 | C | IDAY | -DAY NUMBER FOR DATE OF CURRENT DATA | OUTT0064 |
| 65 | C | | | OUTT0065 |
| 66 | C | IMONTH | -MONTH FOR DATE OF CURRENT DATA | OUTT0066 |
| 67 | C | | | OUTT0067 |
| 68 | C | IYEAR | -YEAR FOR DATE OF CURRENT DATA | OUTT0068 |
| 69 | C | | | OUTT0069 |

| | | | | | |
|-----|---|---|--|----------|----|
| 70 | C | NRSTR(1) | -ALPHANUMERIC NAME OF CONSTRAINT | OUTT0070 | |
| 71 | C | | | OUTT0071 | |
| 72 | C | NAME(1) | -NAME OF TRACK(OR STATIONS USED | OUTT0072 | |
| 73 | C | | | OUTT0073 | |
| 74 | C | HW(1) | -INTERVAL HOUR VALUE OF START/STOP TIMES | OUTT0074 | |
| 75 | C | | | OUTT0075 | |
| 76 | C | JW(1) | -INTERVAL MINUTE VALUE OF START/STOP TIMES | OUTT0076 | |
| 77 | C | | | OUTT0077 | |
| 78 | C | *****RESTRICTIONS***** | | OUTT0078 | |
| 79 | C | THE NUMBER OF TIME INTERVALS PER CONSTRAINT IS FIXED BY THE | | OUTT0079 | |
| 80 | C | REQUIREMENTS OF THE PROGRAM. | | OUTT0080 | |
| 81 | C | SUBROUTINE OUTPUTS TIME VARIABLES WITH NO WEATHER ACCURACY THAN | | OUTT0081 | |
| 82 | C | ONE MINUTE. | | OUTT0082 | |
| 83 | C | | | OUTT0083 | |
| 84 | C | *****SUBROUTINES REQUIRED***** | | OUTT0084 | |
| 85 | C | NONE | | OUTT0085 | |
| 86 | C | | | OUTT0086 | |
| 87 | C | *****END OF DOCUMENTATION CARDS***** | | OUTT0087 | |
| 88 | C | | | OUTT0088 | |
| 89 | | SUBROUTINE OUTTYPE (LINE) | | OUTT0089 | |
| 90 | | COMMON/BLK12/BLK11, F1013 | | OUTT0090 | |
| 91 | | DIMENSION NRSTR(3), NAME(3), WINDOW(6), HW(6), JW(6), PRYSGN(6), | | OUTT0091 | |
| 92 | 1 | SGN(2) | | OUTT0092 | |
| 93 | | DATA SGN / 18-PIW / | | OUTT0093 | |
| 94 | C | READ A RECORD OF DATA | | OUTT0094 | |
| 95 | | 33 READ 17,2050; DJUL,K,1DAY,1MONTH,1YEAR,NRSTR,NAME,WINDOW,1 | | OUTT0095 | |
| 96 | C | IF DJUL=0, THEN RECORD CONTAINS DATA FOR PRINTING | | OUTT0096 | |
| 97 | | IF (DJUL) 1,12,11 | | OUTT0097 | 8 |
| 98 | C | CHECK TO SEE IF THE JULIAN DATA IS WITHIN THE TIME PERIOD REQUESTED | | OUTT0098 | |
| 99 | C | FOR PRINTING, | | OUTT0099 | |
| 100 | | 11 IF (DJUL,EE,999.0) GO TO 01 | | OUTT0100 | 9 |
| 101 | | IFLAG=0 | | OUTT0101 | 12 |
| 102 | | IF (DJUL,GE,BEGIN) IFLAG=1 | | OUTT0102 | 13 |
| 103 | | IF (DJUL,GT,FINIS) RETURN | | OUTT0103 | 16 |
| 104 | | GO TO 13 | | OUTT0104 | 19 |
| 105 | | 12 IF (IFLAG,EQ,0) GO TO 13 | | OUTT0105 | 20 |
| 106 | C | CHANGE TIMES FROM HOURS AND DECIMAL OF HOURS TO HOURS AND MINUTES | | OUTT0106 | |
| 107 | | DO 100 L=3,6 | | OUTT0107 | 23 |
| 108 | | IN(L)=WINDOW(L) | | OUTT0108 | 24 |
| 109 | | IF (IN(L),NE,0) GO TO 40 | | OUTT0109 | 25 |
| 110 | | IF (WINDOW(L),LT,0.) PRYSGN(L)=SGN(1) | | OUTT0110 | 28 |
| 111 | | GO TO 40 | | OUTT0111 | 31 |
| 112 | | 41 PRYSGN(L)=SGN(2) | | OUTT0112 | 32 |
| 113 | | 42 TEMP=HW(L) | | OUTT0113 | 33 |
| 114 | | 100 JW(L)=ABS(WINDOW(L)-TEMP)*60, | | OUTT0114 | 34 |
| 115 | | GO TO (116X,4,4,5), K | | OUTT0115 | 36 |
| 116 | C | PRINT EARTH SHADOW CONSTRAINT TIMES | | OUTT0116 | |
| 117 | | 1 IF (LINE,LT,40) GO TO 30 | | OUTT0117 | 37 |
| 118 | | WRITE (1,1000) | | OUTT0118 | 40 |
| 119 | | IF (WINDOW(2),NE,24.0) GO TO 32 | | OUTT0119 | 42 |
| 120 | | WRITE (1,1001) 1DAY,1MONTH,1YEAR,NRSTR,NAME,(PRYSGN(L),HW(L), | | OUTT0120 | 45 |
| 121 | 1 | JW(L),L=2,2) | | OUTT0121 | |
| 122 | | LINE=6 | | OUTT0122 | 51 |
| 123 | | GO TO 13 | | OUTT0123 | 52 |
| 124 | | 32 WRITE (1,1002) 1DAY,1MONTH,1YEAR,NRSTR,NAME,(PRYSGN(L),HW(L), | | OUTT0124 | 53 |
| 125 | 1 | JW(L),L=1,4) | | OUTT0125 | |
| 126 | | LINE=6 | | OUTT0126 | 59 |
| 127 | | GO TO 13 | | OUTT0127 | 60 |
| 128 | | 33 WRITE (1,1003) | | OUTT0128 | 61 |
| 129 | | IF (WINDOW(2),NE,24.0) GO TO 33 | | OUTT0129 | 63 |
| 130 | | WRITE (1,1004) 1DAY,1MONTH,1YEAR,NRSTR,NAME,(PRYSGN(L),HW(L), | | OUTT0130 | 66 |
| 131 | 1 | JW(L),L=1,2) | | OUTT0131 | |
| 132 | | LINE=LINE+3 | | OUTT0132 | 72 |
| 133 | | GO TO 13 | | OUTT0133 | 73 |
| 134 | | 34 WRITE (1,1005) 1DAY,1MONTH,1YEAR,NRSTR,NAME,(PRYSGN(L),HW(L), | | OUTT0134 | 74 |
| 135 | 1 | JW(L),L=1,4) | | OUTT0135 | |
| 136 | | LINE=LINE+3 | | OUTT0136 | 80 |
| 137 | | GO TO 13 | | OUTT0137 | 81 |
| 138 | C | PRINT SUN TIMES IF K=3 | | OUTT0138 | |
| 139 | C | PRINT MOON TIMES IF K=4 | | OUTT0139 | |
| 140 | | 4 IF (LINE,LT,40) GO TO 34 | | OUTT0140 | 82 |
| 141 | | WRITE (1,1006) | | OUTT0141 | 85 |
| 142 | | WRITE (1,1007) 1DAY,1MONTH,1YEAR,NRSTR,NAME,(PRYSGN(L),HW(L), | | OUTT0142 | 87 |

23859 WORDS OF MEMORY USED BY THIS COMPIATION

PRINT ROUTINE FOR FILE 67 DATA*****

| | |
|---------------|------|
| PROGRAM BREAK | 1299 |
| COMMON LENGTH | 0 |
| V LUNNY DAYS | 9 |

OUTYPE

| BLOCK | LENGTH |
|-------|--------|
| 1 | 10 |
| 2 | 10 |
| 3 | 10 |
| 4 | 10 |
| 5 | 10 |
| 6 | 10 |
| 7 | 10 |
| 8 | 10 |
| 9 | 10 |
| 10 | 10 |
| 11 | 10 |
| 12 | 10 |
| 13 | 10 |
| 14 | 10 |
| 15 | 10 |
| 16 | 10 |
| 17 | 10 |
| 18 | 10 |
| 19 | 10 |
| 20 | 10 |
| 21 | 10 |
| 22 | 10 |
| 23 | 10 |
| 24 | 10 |
| 25 | 10 |
| 26 | 10 |
| 27 | 10 |
| 28 | 10 |
| 29 | 10 |
| 30 | 10 |
| 31 | 10 |
| 32 | 10 |
| 33 | 10 |
| 34 | 10 |
| 35 | 10 |
| 36 | 10 |
| 37 | 10 |
| 38 | 10 |
| 39 | 10 |
| 40 | 10 |
| 41 | 10 |
| 42 | 10 |
| 43 | 10 |
| 44 | 10 |
| 45 | 10 |
| 46 | 10 |
| 47 | 10 |
| 48 | 10 |
| 49 | 10 |
| 50 | 10 |
| 51 | 10 |
| 52 | 10 |
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| 54 | 10 |
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| 56 | 10 |
| 57 | 10 |
| 58 | 10 |
| 59 | 10 |
| 60 | 10 |
| 61 | 10 |
| 62 | 10 |
| 63 | 10 |
| 64 | 10 |
| 65 | 10 |
| 66 | 10 |
| 67 | 10 |
| 68 | 10 |
| 69 | 10 |
| 70 | 10 |
| 71 | 10 |
| 72 | 10 |
| 73 | 10 |
| 74 | 10 |
| 75 | 10 |
| 76 | 10 |
| 77 | 10 |
| 78 | 10 |
| 79 | 10 |
| 80 | 10 |
| 81 | 10 |
| 82 | 10 |
| 83 | 10 |
| 84 | 10 |
| 85 | 10 |
| 86 | 10 |
| 87 | 10 |
| 88 | 10 |
| 89 | 10 |
| 90 | 10 |
| 91 | 10 |
| 92 | 10 |
| 93 | 10 |
| 94 | 10 |
| 95 | 10 |
| 96 | 10 |
| 97 | 10 |
| 98 | 10 |
| 99 | 10 |
| 100 | 10 |

1 BLANK 2

SUMMARY

2 : FENY.
3 : FENY.
4 : FENY.
5 : FENY.
6 : FENY.

7 ,F801,
10 ,F800,
11 ,F80D,
12 ,F80H,

1255 IS THE NEXT AVAILABLE LOCATION.
CHAP VERSION/ASSEMBLY DATES JMDA 050173/052571 JMRB 050171/052571 JHPC 050173/052571
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
** 19639 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY

67906 DE 09-25-72 12,292 SUBROUTINE VTYPE

*****VTYPE FILE *****

| | | | | |
|----|---|--|---|----------|
| 1 | C | VTYPE | SUBROUTINE VTYPE | YTLT0001 |
| 2 | C | *****WRITE FILE ***** | | YTLT0002 |
| 3 | C | | | YTLT0003 |
| 4 | C | *****START OF DOCUMENTATION CARDS***** | | YTLT0004 |
| 5 | C | | | YTLT0005 |
| 6 | C | *****NASA MACLOPS VERSION OF 02X01X10 | | YTLT0006 |
| 7 | C | | | YTLT0007 |
| 8 | C | *****LANGUAGE-FORTRAN IV | | YTLT0008 |
| 9 | C | | | YTLT0009 |
| 10 | C | *****MACHINE-GE 025 | | YTLT0010 |
| 11 | C | | | YTLT0011 |
| 12 | C | *****PURPOSE- | | YTLT0012 |
| 13 | C | TO PRINT THE TOTAL COMBINED WINDOW DATA FOR THE DATES REQUESTED | | YTLT0013 |
| 14 | C | | | YTLT0014 |
| 15 | C | *****METHOD- | | YTLT0015 |
| 16 | C | THE COMBINED WINDOW DATA STORED ON FILE 09 IS READ BY THIS | | YTLT0016 |
| 17 | C | SUBROUTINE, IT IS CONVERTED TO HOURS AND MINUTES BEFORE PRINTING | | YTLT0017 |
| 18 | C | A CHECK IS MADE TO SEE IF THE JULIAN DATE OF THE CURRENT RECORD | | YTLT0018 |
| 19 | C | IS WITHIN THE DATES REQUESTED FOR PRINTING, ONLY THE BLOCK OF | | YTLT0019 |
| 20 | C | DATA WITHIN THE DATES REQUESTED IS PRINTED AND ONLY THOSE TRUE | | YTLT0020 |
| 21 | C | DATA INTERVALS ARE PRINTED AT AN END OF FILE CODE WHERE THE JULIAN | | YTLT0021 |
| 22 | C | DATE EQUALS 999.8 IS USED TO TERMINATE THIS SUBROUTINE, | | YTLT0022 |
| 23 | C | | | YTLT0023 |
| 24 | C | *****INPUTS | | YTLT0024 |
| 25 | C | ON FILE 09 | | YTLT0025 |
| 26 | C | | | YTLT0026 |
| 27 | C | EPDCH | -JULIAN DATE OF JANUARY 0 OF YEAR DATA BEGINS ON | YTLT0027 |
| 28 | C | | -FILE 09 | YTLT0028 |
| 29 | C | | | YTLT0029 |
| 30 | C | BJUL | -JULIAN DATE FOR CURRENT DATA | YTLT0030 |
| 31 | C | | | YTLT0031 |
| 32 | C | IDAY | -DAY NUMBER FOR DATE OF CURRENT DATA | YTLT0032 |
| 33 | C | | | YTLT0033 |
| 34 | C | IMONTH | -MONTH FOR DATE OF CURRENT DATA | YTLT0034 |
| 35 | C | | | YTLT0035 |
| 36 | C | IYEAR | -YEAR FOR DATE OF CURRENT DATA | YTLT0036 |
| 37 | C | | | YTLT0037 |
| 38 | C | BBRIN | -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING | YTLT0038 |
| 39 | C | | | YTLT0039 |
| 40 | C | VBRTU | -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING | YTLT0040 |
| 41 | C | | | YTLT0041 |
| 42 | C | LINE | -LINE COUNT USED TO SKIP TO NEW PAGE AND ERASE | YTLT0042 |
| 43 | C | | -HEADING | YTLT0043 |
| 44 | C | | | YTLT0044 |
| 45 | C | C(6) | -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT | YTLT0045 |
| 46 | C | | -DATE | YTLT0046 |
| 47 | C | | | YTLT0047 |
| 48 | C | B(6) | -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT | YTLT0048 |
| 49 | C | | -DATE | YTLT0049 |
| 50 | C | | | YTLT0050 |
| 51 | C | | | YTLT0051 |
| 52 | C | *****OUTPUT- | | YTLT0052 |
| 53 | C | FILE 06-PRINTER | | YTLT0053 |
| 54 | C | | | YTLT0054 |
| 55 | C | BJUL | -JULIAN DATE FOR CURRENT DATA | YTLT0055 |
| 56 | C | | | YTLT0056 |
| 57 | C | IDAY | -DAY NUMBER FOR DATE OF CURRENT DATA | YTLT0057 |
| 58 | C | | | YTLT0058 |
| 59 | C | IMONTH | -MONTH FOR DATE OF CURRENT DATA | YTLT0059 |


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00 C TTY00060
01 C IYEAR -YEAR FOR DATA OF CURRENT DATA TTY00061
02 C TTY00062
03 C ISEC -INTEGRAL VALUE OF START TIME HOURS TTY00063
04 C TTY00064
05 C JSEC -INTEGRAL VALUE OF START TIME MINUTES TTY00065
06 C TTY00066
07 C ISEC -INTEGRAL VALUE OF STOP TIME HOURS TTY00067
08 C TTY00068
09 C JSEC -INTEGRAL VALUE OF STOP TIME MINUTES TTY00069
10 C TTY00070
11 C TTY00071
12 C *****INSTRUCTIONS***** TTY00072
13 C UP TO SIX DIFFERENT COMBINED WINDOW TIME INTERVALS CAN BE READ TTY00073
14 C AND PRINTED TTY00074
15 C TTY00075
16 C *****SUBPROGRAMS REQUIRED***** TTY00076
17 C NONE TTY00077
18 C *****END OF DOCUMENTATION CARDS***** TTY00078
19 C TTY00079
20 SUBROUTINE TTYPE (LINE) TTY00080
21 COMMON/BUCK27/BUFIN, FINIS TTY00081
22 DIMENSION E(4), D(6) TTY00082
23 DIMENSION IC(6), JC(6), ID(6), JID(6), SGN(6), SGN(6), SGN(2) TTY00083
24 DATA SEN / 1H-92H / TTY00084
25 C READ SPOCH DATE TTY00085
26 READ (9,2002) SPOCH TTY00086
27 C READ A DAY OF DATA TTY00087
28 IF (SPOCH,2002) DJUL, IDAY, MONTH, IYEAR, (C(1), D(1), I(1,6)) TTY00088
29 IF (DJUL,20,999,0) GO TO 12 TTY00089
30 C IF DATA IS WITHIN TIME PERIOD REQUESTED THEN PRINT, IF NOT THEN READ TTY00090
31 C ANOTHER RECORD TTY00091
32 IF (DJUL,LT,BEGIN) GO TO 11 TTY00092
33 IF (DJUL,GT,FINIS) GO TO 12 TTY00093
34 IF (LINE,LT,20) GO TO 22 TTY00094
35 WRITE (6,1000) TTY00095
36 LINE = 1 TTY00096
37 C CHANGE TIME VALUES TO HOURS AND MINUTES TTY00097
38 DO 100, I=1,6 TTY00098
39 I(1) = C(I) TTY00099
40 IF (I(1),NE,0) GO TO 32 TTY0100
41 IF (C(1),LT,0) SGN(1) = SGN(5) TTY0101
42 GO TO 32 TTY0102
43 SGN(1) = SGN(2) TTY0103
44 TEMP = I(1) TTY0104
45 JC(1) = (C(1) - TEMP) / 60 TTY0105
46 I(1) = SGN(1) TTY0106
47 IF (I(1),NE,0) GO TO 32 TTY0107
48 IF (C(1),LT,0) SGN(1) = SGN(5) TTY0108
49 GO TO 32 TTY0109
50 SGN(1) = SGN(2) TTY0110
51 TEMP = I(1) TTY0111
52 JC(1) = (C(1) - TEMP) / 60 TTY0112
53 C DETERMINE HOW MANY TIME INTERVALS ARE TO BE PRINTED BY CHECKING THE TTY0113
54 C VALUE OF C(1); PRINT 1-5 INTERVALS AND READ ANOTHER RECORD OF DATA TTY0114
55 IF (C(1),NE,24,0) GO TO 22 TTY0115
56 WRITE (6,1010) IDAY, MONTH, IYEAR TTY0116
57 LINE = LINE + 1 TTY0117
58 GO TO 15 TTY0118
59 IF (C(1),NE,24,0) GO TO 22 TTY0119
60 WRITE (6,1020) IDAY, MONTH, IYEAR, SGN(1), I(1), JC(1), SGN(1), TTY0120
61 I(1) = JC(1) TTY0121
62 LINE = LINE + 1 TTY0122
63 GO TO 15 TTY0123
64 IF (C(1),NE,24,0) GO TO 22 TTY0124
65 WRITE (6,1030) IDAY, MONTH, IYEAR, SGN(1), I(1), JC(1), SGN(1), TTY0125
66 I(1) = JC(1) TTY0126
67 LINE = LINE + 1 TTY0127
68 GO TO 15 TTY0128
69 IF (C(1),NE,24,0) GO TO 22 TTY0129
70 WRITE (6,1040) IDAY, MONTH, IYEAR, SGN(1), I(1), JC(1), SGN(1), TTY0130
71 I(1) = JC(1) TTY0131
72 LINE = LINE + 1 TTY0132

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| | | | |
|-----|---|----------|-----|
| 133 | 80 Y0 28 | TTLT0233 | 80 |
| 134 | 25 IF (8091,ND,24,0) 80 Y0 26 | TTLT0234 | 89 |
| 135 | WRITE (6,2007) IDAY,IMONTH,ITYEAR,ISGN(1,1011),JC(1),SGND(1), | TTLT0235 | 92 |
| 136 | 1 ID(1),JD(1),22E,41 | TTLT0236 | |
| 137 | LINE =LINE + 1 | TTLT0237 | 98 |
| 138 | 80 Y0 31 | TTLT0238 | 99 |
| 139 | 80 IF (8061,ND,24,0) 80 Y0 27 | TTLT0239 | 200 |
| 140 | WRITE (6,2008) IDAY,IMONTH,ITYEAR,ISGN(1,1011),JC(1),SGND(1), | TTLT0240 | 203 |
| 141 | 1 ID(1),JD(1),22E,51 | TTLT0241 | |
| 142 | LINE =LINE + 1 | TTLT0242 | 209 |
| 143 | 80 Y0 31 | TTLT0243 | 210 |
| 144 | 87 WRITE (6,2007) IDAY,IMONTH,ITYEAR,ISGN(1,1011),JC(1),SGND(1), | TTLT0244 | 211 |
| 145 | 1 ID(1),JD(1),22E,61 | TTLT0245 | |
| 146 | LINE =LINE + 1 | TTLT0246 | 217 |
| 147 | 80 Y0 31 | TTLT0247 | 218 |
| 148 | C NO MORE DATA REQUESTED ON FILE 99 ENDEN-RETURN | TTLT0248 | |
| 149 | 82 RETURN | TTLT0249 | 219 |
| 150 | 2000 FORMAT (1H,10X,51H=000TOTAL DAILY RELEASE WINDOW TIME INTERVALS= | TTLT0250 | 220 |
| 151 | 1000/2,2X,1HDATE,2X, 61HSTRTY,3X,4HSTOR,4X)/,16X,12(6HHR/MIN,2X) | TTLT0251 | |
| 152 | 2/2) | TTLT0252 | |
| 153 | 2001 FORMAT (2X,12,1X,AS,2X,14,3E/41H=000NO RELEASE WINDOW FOR THIS DAY | TTLT0253 | 220 |
| 154 | 1YE00000) | TTLT0254 | |
| 155 | 2002 FORMAT (2X,12,1X,AS,2X,14, 3(5X,2E,12,1H/,12V1X)) | TTLT0255 | 220 |
| 156 | 2003 FORMAT (2X,12,1X,AS,2X,14, 4(5X,2E,12,1H/,12V1X)) | TTLT0256 | 220 |
| 157 | 2004 FORMAT (2X,12,1X,AS,2X,14, 5(5X,2E,12,1H/,12V1X)) | TTLT0257 | 220 |
| 158 | 2005 FORMAT (2X,12,1X,AS,2X,14, 6(5X,2E,12,1H/,12V1X)) | TTLT0258 | 220 |
| 159 | 2006 FORMAT (2X,12,1X,AS,2X,14,10(5X,2E,12,1H/,12V1X)) | TTLT0259 | 220 |
| 160 | 2007 FORMAT (2X,12,1X,AS,2X,14,13(5X,2E,12,1H/,12V1X)) | TTLT0260 | 220 |
| 161 | 2008 FORMAT (P10,2,12,AS,14/P12V12079) | TTLT0261 | 220 |
| 162 | 2001 FORMAT (P10,12) | TTLT0262 | 220 |
| 163 | END | TTLT0263 | 220 |

23727 WORDS OF MEMORY USED BY THIS COMPIATION

67906 02 09-85-72 22,298

SUBROUTINE TITLE

***** FILE *****

PREFACE

| | |
|---------------|------|
| PROGRAM BREAK | 2018 |
| COMMON LENGTH | 0 |
| V COUNT DIVS | 9 |

~~PRIMARY SYNDROM ENTRY~~

TYPE _____

SECONDARY SYNDROMES

| BLOCK | LENGTH |
|-------|--------|
| 1 | 10 |
| 2 | 10 |
| 3 | 10 |
| 4 | 10 |
| 5 | 10 |
| 6 | 10 |
| 7 | 10 |
| 8 | 10 |
| 9 | 10 |
| 10 | 10 |
| 11 | 10 |
| 12 | 10 |
| 13 | 10 |
| 14 | 10 |
| 15 | 10 |
| 16 | 10 |
| 17 | 10 |
| 18 | 10 |
| 19 | 10 |
| 20 | 10 |
| 21 | 10 |
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1 BLANK 2

SUMMER

| | |
|---|-------|
| 2 | PNBV. |
| 3 | PNBL. |
| 4 | PNOD. |
| 5 | PNVN. |
| 6 | PNRD. |

1012 TO THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATE JHDA 050171/052971 JHRA 050171/052971 JHPC 050171/052971
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
66 19599 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY.

67900 02 09-25-72 52,800 SUBROUTINE ALYR2N

~~1 CELTA SUBROUTING PLANT~~

PLTR0001

| | | | |
|----|---|---|----------|
| 2 | C | CHOOSE.....PLOT ROUTINE..... | PLTR0002 |
| 3 | C | | PLTR0003 |
| 4 | C | CHOOSE.....STORY OR DOCUMENTATION CARD..... | PLTR0004 |
| 5 | C | | PLTR0005 |
| 6 | C | CHOOSE.....NABA WALLPS VERSION OF 55101759 | PLTR0006 |
| 7 | C | | PLTR0007 |
| 8 | C | CHOOSE.....LANGUAGE.....FORTRAN IV | PLTR0008 |
| 9 | C | | PLTR0009 |
| 10 | C | CHOOSE.....MACHINE-GE 625 | PLTR0010 |
| 11 | C | | PLTR0011 |
| 12 | C | | PLTR0012 |
| 13 | C | CHOOSE.....PURPOSE..... | PLTR0013 |
| 14 | C | YES GRAPH THE COMPUTED RELEASE WINDOW TIMES FOR THE NABA/MR? | PLTR0014 |
| 15 | C | WANTON FOR CLOUD PROJECT FOR A GIVEN YEAR OR PORTION OF A YEAR | PLTR0015 |
| 16 | C | | PLTR0016 |
| 17 | C | CHOOSE.....METHOD..... | PLTR0017 |
| 18 | C | THIS SUBROUTINE USES EXISTING SAUCOMR LIBRARY ROUTINES TO PLOT | PLTR0018 |
| 19 | C | THE RELEASE TIMES CALCULATED FOR THE SIC PROJECT THROUGH THIS | PLTR0019 |
| 20 | C | PROGRAM ONTO A GRID AS SET UP IN SUBROUTINE CALDN; THE INPUT | PLTR0020 |
| 21 | C | POSITION OF THE RELEASE POINTS THE TRACKING STATIONS USED AND | PLTR0021 |
| 22 | C | THE VALUE OF EACH CONSTRAINT IS GIVEN IN THE PLOT LABELING; | PLTR0022 |
| 23 | C | RELEASE TIMES PLOTTED ARE THOSE DAILY TIMES RECORDED ON | PLTR0023 |
| 24 | C | FILE 09 BY THIS PROGRAM, | PLTR0024 |
| 25 | C | | PLTR0025 |
| 26 | C | CHOOSE.....RESTRICTIONS..... | PLTR0026 |
| 27 | C | THIS SUBROUTINE WILL PLOT DATA ONLY FOR A GIVEN CALENDAR YEAR | PLTR0027 |
| 28 | C | OR PORTION OF IT PLOTTING OF TWO OR MORE CALENDAR YEARS | PLTR0028 |
| 29 | C | REQUIRES THAT THE PROGRAM BE REINITIALIZED FOR PLOTTING EACH | PLTR0029 |
| 30 | C | CALENDAR YEAR; THIS RESTRICTION IS DUE TO THE GRID PLOT | PLTR0030 |
| 31 | C | GENERATED THROUGH SUBROUTINE CALDN; A CHECK IS MADE TO ENSURE | PLTR0031 |
| 32 | C | THE NUMBER OF DAYS PAST JANUARY 1 OF THE GIVEN CALENDAR YEAR IS | PLTR0032 |
| 33 | C | NO MORE THAN 365 DAYS; THIS CHECK IS DONE SO THE PLOTS OF | PLTR0033 |
| 34 | C | SUCCESSIVE CALENDAR YEARS CAN BE MADE FROM ONE FILE OR TAPE; | PLTR0034 |
| 35 | C | NEGLIGTING THIS RESTRICTION AND ATTEMPTING TO PLOT SUCCESSIVE | PLTR0035 |
| 36 | C | CALENDAR YEARS ON THE SAME GRID WILL GIVE AN ERRONEOUS PLOT; | PLTR0036 |
| 37 | C | (I.E., EVERY JANUARY 1 OF ANY CALENDAR YEAR WILL BE PLOTTED AT | PLTR0037 |
| 38 | C | THE BEGINNING OF THE GRID); | PLTR0038 |
| 39 | C | | PLTR0039 |
| 40 | C | CHOOSE.....INPUT..... | PLTR0040 |
| 41 | C | | PLTR0041 |
| 42 | C | 1. FOR PLOT LABELLING ONLY:- | PLTR0042 |
| 43 | C | | PLTR0043 |
| 44 | C | KYR - YEAR BEING PLOTTED AND/OR PRINTED | PLTR0044 |
| 45 | C | | PLTR0045 |
| 46 | C | PHIPDS - GEODESIC LATITUDE OF RELEASE POINT (DEG) | PLTR0046 |
| 47 | C | | PLTR0047 |
| 48 | C | LAMPDS - LONGITUDE OF RELEASE POINT (DEG) | PLTR0048 |
| 49 | C | | PLTR0049 |
| 50 | C | HEIGHT - ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE | PLTR0050 |
| 51 | C | -(KM) | PLTR0051 |
| 52 | C | | PLTR0052 |
| 53 | C | RESTN(2) - MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION | PLTR0053 |
| 54 | C | - TO THE RELEASE POINT (DEG) | PLTR0054 |
| 55 | C | | PLTR0055 |
| 56 | C | RESTN(3) - MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH | PLTR0056 |
| 57 | C | - TRACKING STATION (DEG) | PLTR0057 |
| 58 | C | | PLTR0058 |
| 59 | C | RESTN(4) - MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH | PLTR0059 |
| 60 | C | - TRACKING STATION (DEG) | PLTR0060 |
| 61 | C | | PLTR0061 |
| 62 | C | RESTN(5) - MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE | PLTR0062 |
| 63 | C | - RELEASE POINT AS SEEN FROM EACH TRACKING STATION | PLTR0063 |
| 64 | C | -(MAGNITUDE) | PLTR0064 |
| 65 | C | | PLTR0065 |
| 66 | C | RESTN(6) - CONSTANT LONGITUDINAL DRIFF RATE OF THE CLOUD | PLTR0066 |
| 67 | C | - AFTER RELEASE RELATIVE TO THE TRACKING STATIONS | PLTR0067 |
| 68 | C | -(KM/SEC) | PLTR0068 |
| 69 | C | | PLTR0069 |
| 70 | C | RESTN(7) - MINIMUM TRACKING PERIOD REQUIRED (HRS) | PLTR0070 |
| 71 | C | | PLTR0071 |
| 72 | C | RESTN(8) - ONE-HALF HP CLOUD GROWTH RATE AFTER RELEASE | PLTR0072 |
| 73 | C | - RELATIVE TO THE EARTH (KM/SEC) | PLTR0073 |
| 74 | C | | PLTR0074 |
| 75 | C | NAME(3,12) - NAME OF TRACKING STATIONS USED | PLTR0075 |

| | | | | |
|-----|---|--|---|----------|
| 76 | C | | | PLTR0076 |
| 77 | C | IBASE | -BASE NUMBER | PLTR0077 |
| 78 | C | | | PLTR0078 |
| 79 | C | | | PLTR0079 |
| 80 | C | 2,USED FOR DATA PLOTTING- | | PLTR0080 |
| 81 | C | | | PLTR0081 |
| 82 | C | NS | -THE NUMBER OF STATIONS USED IN THE PROGRAM | PLTR0082 |
| 83 | C | | | PLTR0083 |
| 84 | C | NOS(12) | -AN ARRAY CONTAINING THE STATION NUMBERS USED | PLTR0084 |
| 85 | C | | | PLTR0085 |
| 86 | C | EPOCH | -JULIAN DATE OF JANUARY 1 OF YEAR DATA BEGINS ON | PLTR0086 |
| 87 | C | | -FILE 09 | PLTR0087 |
| 88 | C | | | PLTR0088 |
| 89 | C | DJUL | -JULIAN DATE FOR CURRENT DATA | PLTR0089 |
| 90 | C | | | PLTR0090 |
| 91 | C | BEGIN | -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING | PLTR0091 |
| 92 | C | | | PLTR0092 |
| 93 | C | FINIS | -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING | PLTR0093 |
| 94 | C | | | PLTR0094 |
| 95 | C | C(6) | -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT | PLTR0095 |
| 96 | C | | -DATE | PLTR0096 |
| 97 | C | | | PLTR0097 |
| 98 | C | D(6) | -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT | PLTR0098 |
| 99 | C | | -DATE | PLTR0099 |
| 100 | C | | | PLTR0100 |
| 101 | C | | | PLTR0101 |
| 102 | C | *****OUTPUT- | | PLTR0102 |
| 103 | C | DATA POINTS FOR PLOT ARE STORED ON TAPE FILE 51 AT 556 BP: | | PLTR0103 |
| 104 | C | | | PLTR0104 |
| 105 | C | X | -POSITION OF PLOT PEN ON X-AXIS REPRESENTING THE | PLTR0105 |
| 106 | C | | -DATE BEING PLOTTED | PLTR0106 |
| 107 | C | | | PLTR0107 |
| 108 | C | Y | -POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE | PLTR0108 |
| 109 | C | | -START TIME FOR DATE BEING PLOTTED | PLTR0109 |
| 110 | C | | | PLTR0110 |
| 111 | C | H | -POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE | PLTR0111 |
| 112 | C | | -STOP TIME FOR DATE BEING PLOTTED | PLTR0112 |
| 113 | C | | | PLTR0113 |
| 114 | C | *****SUBPROGRAMS REQUIRED- | | PLTR0114 |
| 115 | C | BAR (CALCOMP LIBRARY ROUTINE) | | PLTR0115 |
| 116 | C | PLOT (CALCOMP LIBRARY ROUTINE) | | PLTR0116 |
| 117 | C | NUMBER (CALCOMP LIBRARY ROUTINE) | | PLTR0117 |
| 118 | C | SYMBOL (CALCOMP LIBRARY ROUTINE) | | PLTR0118 |
| 119 | C | DATE GMAP ASSEMBLY | | PLTR0119 |
| 120 | C | CALDNR | | PLTR0120 |
| 121 | C | | | PLTR0121 |
| 122 | C | *****END OF DOCUMENTATION CARDS***** | | PLTR0122 |
| 123 | C | | | PLTR0123 |
| 124 | C | SUBROUTINE PLYRN | | PLTR0124 |
| 125 | C | COMMON/BLK1 /KMONTH,MDAY ,LYEAR ,LMONTH,LDAY ,LYEAR ,KMO,MDA, | | PLTR0125 |
| 126 | C | 1 KVR, LBOX LBA, LTR, ICALC, IPRY7, IPRY9, IPRY11, IPRY12, | | PLTR0126 |
| 127 | C | COMMON/BLK2 /BEGIN, FINIS | | PLTR0127 |
| 128 | C | COMMON/BLK3 /PHIPDG,LANPDG,HELOWT | | PLTR0128 |
| 129 | C | COMMON/BLK4 /NSTR(8) | | PLTR0129 |
| 130 | C | COMMON/BLK5 /NS, NOS(12) | | PLTR0130 |
| 131 | C | COMMON/BLK6 /NAME(3,12), RM(12), LAMBDA(12), ALT(12), MOVE(12) | | PLTR0131 |
| 132 | C | COMMON/BLK7 /IBASE, IFINAL | | PLTR0132 |
| 133 | C | DIMENSION E(6), D(6) | | PLTR0133 |
| 134 | C | REAL LANPDG | | PLTR0134 |
| 135 | C | SEV UP PLOT GRID | | PLTR0135 |
| 136 | C | CALL CALDNR | | PLTR0136 |
| 137 | C | LABEL V=EXTS | | PLTR0137 |
| 138 | C | CALL NUMBER (-.24, 1.500700, 0.2700, 0.00-3) | | PLTR0138 |
| 139 | C | CALL NUMBER (-.24, 2.007000, 0.2700, 0.00-3) | | PLTR0139 |
| 140 | C | X = 0.0 | | PLTR0140 |
| 141 | C | Y = 0.0 | | PLTR0141 |
| 142 | C | DO 240 I = 1, 120 | | PLTR0142 |
| 143 | C | CALL NUMBER (-.16, 1.0000, 0.0000, 0.00-3) | | PLTR0143 |
| 144 | C | Z = 0.0 | | PLTR0144 |
| 145 | C | 200 V = Y00.0 | | PLTR0145 |
| 146 | C | DO 250 I = 1, 120 | | PLTR0146 |
| 147 | C | CALL NUMBER (-.24, 1.0000, 0.0000, 0.00-3) | | PLTR0147 |
| 148 | C | X = 0.0 | | PLTR0148 |
| 149 | C | 250 V = Y00.0 | | PLTR0149 |

[illegible]

04# TODAY DOES NOT APPEAR IN READ, DATA, COMMON OR LEFT OF EQUALS (=)

23854 WORDS OF MEMORY USED BY THIS COMPIATION

~~67908 08 09-25-72 12,305 SUBROUTINE PLTVTH~~

தமிழகத்தின் உருவகம்

PREFACE

| | |
|------------------|-------|
| PROGRAM BREAK | 1344 |
| COMMON LENGTH | 0 |
| V COUNT BITS | 5 |
| PRIMARY SYMDEF | ENTRY |
| PLTBYN | 0 |
| SECONDARY SYMDEF | ENTRY |

| | BLANK | LENGTH |
|---|--------|--------|
| 1 | BLANK | 25 |
| 2 | BLANK2 | 2 |
| 3 | BLANK | 3 |
| 4 | BLANK | 10 |
| 5 | BLANK | 19 |
| 6 | BLANK | 124 |
| 7 | BLANK | 2 |

~~SVNREF~~

| | |
|----|---------|
| 10 | BAB |
| 11 | DAVE |
| 12 | PLEY |
| 13 | CALNDR |
| 14 | .FERNV. |
| 15 | .PHOD. |
| 16 | .PEVN. |
| 17 | .PENY. |
| 20 | NUMBER |
| 21 | SYNCHON |

1344 IS THE NEXT AVAILABLE LOCATION.
 GWAP VERSION/ASSEMBLY DATES JHPA 050171/052571 JHMB 050171/052571 JHPC 050171/052571
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY
 66 19618 WORDS OF MEMORY WERE USED BY GWAP FOR THIS ASSEMBLY.

67906 68 09-25-72 12,310 CALENDAR PHOTO BOOTING

*****SHOOTING GALN*****

| | | |
|---|---|----------|
| 1 | CBAAM CALENDAR PLOT RUBYING | CALN0001 |
| 2 | CBBB*****SUBROUTINE CALND ***** | CALN0002 |
| 3 | C | CALN0003 |
| 4 | C*****START OF DOCUMENTATION CROSS***** | CALN0004 |
| 5 | C | CALN0005 |
| 6 | C*****NABA WALLOPS VERSION OF 01X01A09 | CALN0006 |

~~~~~

67906 ON 09-25-72 12,313 CALENDAR PLOT ROUTINE

\*\*\*\*\*SUBROUTINE BALND \*\*\*\*\*

|               |      |
|---------------|------|
| PROGRAM BREAK | 2302 |
| COMMON LENGTH | 0    |
| V COUNT BITS  | 5    |

~~PRIMARY SYNDROME ENTRY~~

CALNDR

SECONDARY SYMPTOM ENTRY

| BLOCK | LENGTH |
|-------|--------|
| 1     | 10     |
| 2     | 10     |
| 3     | 10     |
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| 100   | 10     |

SUNREF

- |   |        |
|---|--------|
| 1 | GRTO   |
| 2 | PLDV   |
| 3 | PLEVS  |
| 4 | FABYON |
| 5 | NUMGER |
| 6 | SYMBOL |

2562 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JHPA 050171/052521 JMRB 050171/052521 JMPC 050171/052521

THERE WERE NO HANGING FLAMES IN THE ABOVE ASSEMBLY

44 19299 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY?

67906 02 09-25-72 12,317 SUBROUTINE MOPL?

\*\*\*\*\*MONTHLY FLOT ROUTINE\*\*\*\*\*

|    |                                         |                                                                |          |
|----|-----------------------------------------|----------------------------------------------------------------|----------|
| 1  | CHOPPL                                  | SUBROUTINE MONTHLY                                             | HOPL0801 |
| 2  | C#####MONTHLY PLOT ROUTINE#####         |                                                                | HOPL0802 |
| 3  | C                                       |                                                                | HOPL0803 |
| 4  | C#####START OF DOCUMENTATION CARDS##### |                                                                | HOPL0804 |
| 5  | C                                       |                                                                | HOPL0805 |
| 6  | C#####NASA WALLEPS VERSION OF 81X01A69  |                                                                | HOPL0806 |
| 7  | C                                       |                                                                | HOPL0807 |
| 8  | C#####LANGUAGE-FORTRAN IV               |                                                                | HOPL0808 |
| 9  | C                                       |                                                                | HOPL0809 |
| 10 | C#####MACHINE-GS 625                    |                                                                | HOPL0810 |
| 11 | C                                       |                                                                | HOPL0811 |
| 12 | C#####PURPOSE-                          |                                                                | HOPL0812 |
| 13 | C                                       | TO GRAPH THE COMPUTED RELEASE WINDOW TIMES FOR THE NASAXMR     | HOPL0813 |
| 14 | C                                       | BARIUM ION CLOUD PROJECT FOR A GIVEN MONTH OR PORTION OF IT    | HOPL0814 |
| 15 | C                                       |                                                                | HOPL0815 |
| 16 | C#####METHOD-                           |                                                                | HOPL0816 |
| 17 | C                                       | THIS SUBROUTINE USES EXISTING CALCOMP LIBRARY ROUTINES TO PLOT | HOPL0817 |
| 18 | C                                       | THE RELEASE TIMES CALCULATED FOR THE BIC PROJECT THROUGH THIS  | HOPL0818 |
| 19 | C                                       | PROGRAM ONTO A GRID AS SET UP IN SUBROUTINE HSCALE;THE INPUT   | HOPL0819 |
| 20 | C                                       | POSITION OF THE RELEASE POINTS,THE TRACKING STATIONS USED AND  | HOPL0820 |
| 21 | C                                       | THE VALUE OF EACH CONSTRAINT IS GIVEN IN THE PLOT LABELING;    | HOPL0821 |
| 22 | C                                       | RELEASE TIMES PLOTTED ARE THOSE DAILY TIMES RECORDED ON        | HOPL0822 |
| 23 | C                                       | FILE 09 BY THIS PROGRAM,                                       | HOPL0823 |
| 24 | C                                       |                                                                | HOPL0824 |
| 25 | C                                       |                                                                | HOPL0825 |
| 26 | C#####INPUTS                            |                                                                | HOPL0826 |
| 27 | C                                       |                                                                | HOPL0827 |
| 28 | C                                       | 1.FOR PLOT LABELING ONLY-                                      | HOPL0828 |
| 29 | C                                       |                                                                | HOPL0829 |



|     |   |            |                                                            |          |
|-----|---|------------|------------------------------------------------------------|----------|
| 30  | C | KMB        | -MONTH BEING PLOTTED AND/OR PRINTED                        | MOPL0030 |
| 31  | C |            |                                                            | MOPL0031 |
| 32  | C | KYR        | -YEAR BEING PLOTTED AND/OR PRINTED                         | MOPL0032 |
| 33  | C |            |                                                            | MOPL0033 |
| 34  | C | PHIPDG     | -GEODEIC LATITUDE OF RELEASE POINT (DEG)                   | MOPL0034 |
| 35  | C |            |                                                            | MOPL0035 |
| 36  | C | LAMPDG     | -LONGITUDE OF RELEASE POINT (DEG)                          | MOPL0036 |
| 37  | C |            |                                                            | MOPL0037 |
| 38  | C | HEIGHT     | -ALTITUDE OF RELEASE POINT ABOVE EARTH SURFACE             | MOPL0038 |
| 39  | C |            | -(GRM)                                                     | MOPL0039 |
| 40  | C |            |                                                            | MOPL0040 |
| 41  | C | RESTR(2)   | -MINIMUM ELEVATION LOOK ANGLE FROM EACH STATION            | MOPL0041 |
| 42  | C |            | -TO THE RELEASE POINT (DEG)                                | MOPL0042 |
| 43  | C |            |                                                            | MOPL0043 |
| 44  | C | RESTR(3)   | -MAXIMUM SUN ELEVATION LOOK ANGLE FROM EACH                | MOPL0044 |
| 45  | C |            | -TRACKING STATION (DEG)                                    | MOPL0045 |
| 46  | C |            |                                                            | MOPL0046 |
| 47  | C | RESTR(4)   | -MAXIMUM MOON ELEVATION LOOK ANGLE FROM EACH               | MOPL0047 |
| 48  | C |            | -TRACKING STATION (DEG)                                    | MOPL0048 |
| 49  | C |            |                                                            | MOPL0049 |
| 50  | C | RESTR(5)   | -MAXIMUM TOTAL SKY BACKGROUND BRIGHTNESS OF THE            | MOPL0050 |
| 51  | C |            | -RELEASE POINT TO BE SEEN FROM EACH TRACKING STATION       | MOPL0051 |
| 52  | C |            | -(RAYLENGTHS)                                              | MOPL0052 |
| 53  | C |            |                                                            | MOPL0053 |
| 54  | C | RESTR(6)   | -CONSTANT LONGITUDINAL DRIFT RATE OF THE CLOUD             | MOPL0054 |
| 55  | C |            | -AFTER RELEASE RELATIVE TO THE TRACKING STATIONS           | MOPL0055 |
| 56  | C |            | -(MM/SEC)                                                  | MOPL0056 |
| 57  | C |            |                                                            | MOPL0057 |
| 58  | C | RESTR(7)   | -MINIMUM TRACKING PERIOD REQUIRED (HRS)                    | MOPL0058 |
| 59  | C |            |                                                            | MOPL0059 |
| 60  | C | RESTR(8)   | -ONE-HALF OF CLOUD GROWTH RATE AFTER RELEASE               | MOPL0060 |
| 61  | C |            | -RELATIVE TO THE EARTH (MM/SEC)                            | MOPL0061 |
| 62  | C |            |                                                            | MOPL0062 |
| 63  | C | NAME(3,12) | -NAME OF TRACKING STATIONS USED                            | MOPL0063 |
| 64  | C |            |                                                            | MOPL0064 |
| 65  | C | ICASE      | -CASE NUMBER                                               | MOPL0065 |
| 66  | C |            |                                                            | MOPL0066 |
| 67  | C |            |                                                            | MOPL0067 |
| 68  | C |            | 2. USED FOR DATA PLOTTING.                                 | MOPL0068 |
| 69  | C |            |                                                            | MOPL0069 |
| 70  | C | NS         | -THE NUMBER OF STATIONS USED IN THE PROGRAM                | MOPL0070 |
| 71  | C |            |                                                            | MOPL0071 |
| 72  | C | NOB(12)    | -AN ARRAY CONTAINING THE STATION NUMBERS USED              | MOPL0072 |
| 73  | C |            |                                                            | MOPL0073 |
| 74  | C | EWBCH      | -JULIAN DATE OF JANUARY 8 OF YEAR DATA BEGINS ON           | MOPL0074 |
| 75  | C |            | -FILE 89                                                   | MOPL0075 |
| 76  | C |            |                                                            | MOPL0076 |
| 77  | C | BJUL       | -JULIAN DATE FOR CURRENT DATA                              | MOPL0077 |
| 78  | C |            |                                                            | MOPL0078 |
| 79  | C | BEGIN      | -JULIAN DATE TO BEGIN PRINTING AND/OR PLOTTING             | MOPL0079 |
| 80  | C |            |                                                            | MOPL0080 |
| 81  | C | FINIS      | -JULIAN DATE TO STOP PRINTING AND/OR PLOTTING              | MOPL0081 |
| 82  | C |            |                                                            | MOPL0082 |
| 83  | C | C(6)       | -ARRAY OF COMBINED WINDOW START TIMES FOR CURRENT          | MOPL0083 |
| 84  | C |            | -DATE                                                      | MOPL0084 |
| 85  | C |            |                                                            | MOPL0085 |
| 86  | C | D(6)       | -ARRAY OF COMBINED WINDOW STOP TIMES FOR CURRENT           | MOPL0086 |
| 87  | C |            | -DATE                                                      | MOPL0087 |
| 88  | C |            |                                                            | MOPL0088 |
| 89  | C |            |                                                            | MOPL0089 |
| 90  | C |            | 3. *****OUTPUT*****                                        | MOPL0090 |
| 91  | C |            |                                                            | MOPL0091 |
| 92  | C |            | DATA POINTS FOR PLOT ARE STORED ON TAPE FILE 01 AT 556 BP. | MOPL0092 |
| 93  | C |            |                                                            | MOPL0093 |
| 94  | C | X          | -POSITION OF PLOT PEN ON X-AXIS REPRESENTING THE           | MOPL0094 |
| 95  | C |            | -DATE BEING PLOTTED                                        | MOPL0095 |
| 96  | C |            |                                                            | MOPL0096 |
| 97  | C | Y          | -POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE           | MOPL0097 |
| 98  | C |            | -START TIME FOR DATE BEING PLOTTED                         | MOPL0098 |
| 99  | C |            |                                                            | MOPL0099 |
| 100 | C | H          | -POSITION OF PLOT PEN ON Y-AXIS REPRESENTING THE           | MOPL0100 |
| 101 | C |            | -STOP TIME FOR DATE BEING PLOTTED                          | MOPL0101 |
| 102 | C |            |                                                            | MOPL0102 |
| 103 | C |            | 4. *****RESTRICTIONS*****                                  | MOPL0103 |



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104 C THIS SUBROUTINE WILL PLOT DATA ONLY FOR A GIVEN CALENDAR MONTH MOPL0204
105 C OR PORTION OF IT, PLOTTING OF TWO OR MORE CALENDAR MONTHS MOPL0205
106 C REQUIRES THAT THE PROGRAM BE INITIATED FOR PLOTTING EACH MOPL0206
107 C CALENDAR MONTH, THIS RESTRICTION IS DUE TO THE GRID PLOT MOPL0207
108 C GENERATED THROUGH SUBROUTINE HOCALD, A CHECK IS MADE TO INSURE MOPL0208
109 C THE NUMBER OF DAYS PAST THE FIRST OF THE GIVEN CALENDAR MONTH MOPL0209
110 C IS WITHIN BOUNDS. THIS CHECK IS DONE SO THE PLOTS OF MOPL0210
111 C SUCCESSIVE CALENDAR MONTHS CAN BE MADE FROM ONE FILE OR TAPE, MOPL0211
112 C SELECTING THIS RESTRICTION AND ATTEMPTING TO PLOT SUCCESSIVE MOPL0212
113 C CALENDAR MONTHS ON THE SAME GRID WILL GIVE AN ERRONEOUS PLOT, MOPL0213
114 C THIS PROGRAM HANDLES UP TO 12 STATIONS TO GET COMBINED WINDOWS MOPL0214
115 C MOPL0215
116 C*****SUBPROGRAMS REQUIRED. MOPL0216
117 C BAR (CALCOMP LIBRARY ROUTINE) MOPL0217
118 C PLOT (CALCOMP LIBRARY ROUTINE) MOPL0218
119 C NUMBER (CALCOMP LIBRARY ROUTINE) MOPL0219
120 C SYMBOL (CALCOMP LIBRARY ROUTINE) MOPL0220
121 C DAYS= CHAN ASSEMBLY MOPL0221
122 C HOCALD MOPL0222
123 C MOPL0223
124 C*****END OF DOCUMENTATION CARDS***** MOPL0224
125 C MOPL0225
126 SUBROUTINE MOPLT MOPL0226
127 COMMON/BLKX 2KMONTH,KDAY ,LYEAR ,LMONTH,LDAY ,LYEAR ,KMO, LDA, MOPL0227
128 1 KYR, LMO, LDA, LYR, LCAL, IPRT1, IPRT9, IPRT11, PLOT MOPL0228
129 COMMON/BLKX2 2BEGIN, FINIS MOPL0229
130 COMMON/BLKX 7PRIPDG,LAMPDG,WEIGHT MOPL0230
131 COMMON/BLKX 7RSTRT18 MOPL0231
132 COMMON/BLKX 2NS, NS(12) MOPL0232
133 COMMON/BLKX 7NAME(3,12), RW(12), LAMBDA(12), ALT(12), MOVE(12) MOPL0233
134 COMMON/BLKX 7ICASE,IFINAL MOPL0234
135 DIMENSION C(6), D(6) MOPL0235
136 DIMENSION NDAYS(12) MOPL0236
137 REAL LAMPDG MOPL0237
138 DATA NDAYS/31,28,31,30,31,30,31,31,30,31,30,31/ MOPL0238
139 C SET UP PLOT GRID MOPL0239
140 CALL HOCALD (KMO) MOPL0240
141 C LABEL Y-AXIS MOPL0241
142 CALL NUMBER(=,24,90700,=270,0,0,=1) MOPL0242
143 CALL NUMBER(=,24,1070,0,=-1700,070,=1) MOPL0243
144 X = 0.0 MOPL0244
145 Y = 3.5 MOPL0245
146 DO 240 I = 1,10 MOPL0246
147 CALL NUMBER(=-,16,14,0,00,X,070,0,=) MOPL0247
148 X = X+10 MOPL0248
149 240 Y = Y+0.5 MOPL0249
150 DO 250 I = 1,8 MOPL0250
151 CALL NUMBER(=-,24,14,0,00,X,070,0,=) MOPL0251
152 X = X+10 MOPL0252
153 250 Y = Y+0.5 MOPL0253
154 CALL SYMBOL(=,40,3,00,0,00, 23HUNIVERSAL TIME IN HOURS,90,0,23) MOPL0254
155 C WRITE PROGRAM INPUT DATA ON PLOT MOPL0255
156 C MOPL0256
157 CALL PLOT(=,11,0,0,0,=3) MOPL0257
158 CALL SYMBOL(15,5,7,92,0,00,20HMAN-PLANCK ION GLOUD,0,0,20) MOPL0258
159 CALL SYMBOL(15,5,7,86,0,00,20H RELEASE TIMES (0,0,20) MOPL0259
160 CALL SYMBOL(15,5,7,80,0,00,20H FOR (0,0,20) MOPL0260
161 CALL NUMBER(10,0,0,7,00,0,00,ALBATRYKVS,1070,=-1) MOPL0261
162 IF (IABS,RY,1) GO TO 24 MOPL0262
163 CALL SYMBOL(15,5,7,86,0,00,20HRELEASE POINT,0,0,13) MOPL0263
164 CALL SYMBOL(15,5,7,80,0,00, 20H LTT (0,0,0) MOPL0264
165 CALL NUMBER(10,22,0,20,0,00,0,0,0,3) MOPL0265
166 CALL SYMBOL(15,5,7,84,0,00, 20H LAMB (0,0,0) MOPL0266
167 CALL NUMBER(10,22,0,0,0,00,0,0,0,3) MOPL0267
168 CALL SYMBOL(15,5,6,80,0,00, 20H ADT (0,0,0) MOPL0268
169 CALL NUMBER(10,22,0,0,0,00,0,0,0,3) MOPL0269
170 CALL SYMBOL(15,5,6,0,0,00,20H SUN ELEVATION = DEG,(070,29) MOPL0270
171 CALL NUMBER(10,94,0,0,0,00,0,0,0,1) MOPL0271
172 CALL SYMBOL(15,5,6,0,0,00,20H SUN ELEVATION = DEG,(070,29) MOPL0272
173 CALL NUMBER(10,94,0,0,0,00,0,0,0,1) MOPL0273
174 CALL SYMBOL(15,5,6,0,0,00,20H SUN ELEVATION = DEG,(070,29) MOPL0274
175 CALL NUMBER(10,94,0,0,0,00,0,0,0,1) MOPL0275
176 CALL SYMBOL(15,5,6,0,0,00,20H SKY BRIGHTNESS = R/A,(0,0,20) MOPL0276
177 CALL NUMBER(10,94,0,0,0,00,0,0,0,1) MOPL0277

```

|     |                                                                   |                |          |     |
|-----|-------------------------------------------------------------------|----------------|----------|-----|
| 176 | CALL SYMBOL(15,74,5,878,08,288 SCUD DRAFT *                       | MM/SEC(0,0,28) | MOPL0278 | 40  |
| 177 | CALL NUMBER(16,74,5,878,08,288 SCUD DRAFT *                       |                | MOPL0279 | 41  |
| 180 | CALL SYMBOL(15,5,5,8,8,288 CLOUD GROWTH *                         | MM/SEC(0,0,29) | MOPL0280 | 42  |
| 181 | CALL NUMBER(16,74,5,878,08,288 CLOUD GROWTH *                     |                | MOPL0281 | 43  |
| 182 | CALL SYMBOL(15,66,5,478,08,288 CLOUD GROWTH TIME *                | MRS(,0,0,27)   | MOPL0282 | 44  |
| 183 | CALL NUMBER(16,74,5,478,08,288 CLOUD GROWTH TIME *                |                | MOPL0283 | 45  |
| 184 | GO TO 22                                                          |                | MOPL0284 | 46  |
| 185 | C PLOT TITLE FOR MULTIPLE CASE PLOT                               |                | MOPL0285 |     |
| 186 | 21 CALL SYMBOL(15,5,7,5678,08,288 MULTIPLE CASE INPUT 70,0,28)    |                | MOPL0286 | 47  |
| 187 | 22 CALL SYMBOL(15,5,5,8,8,138 STATISTICS COMBINED 70,0,17)        |                | MOPL0287 | 48  |
| 188 | Y = 4.08                                                          |                | MOPL0288 | 49  |
| 189 | DO 55 TO 1, NB                                                    |                | MOPL0289 | 50  |
| 190 | J = NBS(1)                                                        |                | MOPL0290 | 51  |
| 191 | CALL SYMBOL(15,66,5,478,08,288 NAME(1, J), 0, 0, 28)              |                | MOPL0291 | 52  |
| 192 | 55 Y = Y + .38                                                    |                | MOPL0292 | 53  |
| 193 | CALL SYMBOL(15,5,1,5,8,8,788 PLOTTED 70,0,7)                      |                | MOPL0293 | 55  |
| 194 | C SET THE DATE OF TODAY                                           |                | MOPL0294 |     |
| 195 | CALL DATE ( TODAY *                                               |                | MOPL0295 | 56  |
| 196 | CALL SYMBOL( 15,74,5,878,08,288 TODAY, 6, 6, 0)                   |                | MOPL0296 | 57  |
| 197 | C                                                                 |                | MOPL0297 |     |
| 198 | C SET ORIGIN ON ZERO TIME                                         |                | MOPL0298 |     |
| 199 | C                                                                 |                | MOPL0299 |     |
| 200 | CALL PLOT (11, 0, 1, 5, 0)                                        |                | MOPL0300 | 58  |
| 201 | C REWIND INPUT DATA TAPE                                          |                | MOPL0301 |     |
| 202 | REWIND 09                                                         |                | MOPL0302 | 59  |
| 203 | C READ EPOCH DATE                                                 |                | MOPL0303 |     |
| 204 | READ 19, 1081, EPOCH                                              |                | MOPL0304 | 60  |
| 205 | C ADJUSTMENT FOR EPOCH DATE FOR 1ST DAY OF THE MONTH              |                | MOPL0305 |     |
| 206 | NDA = 0                                                           |                | MOPL0306 | 63  |
| 207 | DO 206 TO 1, KMO                                                  |                | MOPL0307 | 64  |
| 208 | 206 NDA = NDA + NDAYS(1)                                          |                | MOPL0308 | 65  |
| 209 | NDA = NDA + NDAYS(NMO) + KBA                                      |                | MOPL0309 | 67  |
| 210 | C READ A DAY OF DATA                                              |                | MOPL0310 |     |
| 211 | 22 READ 19, 1080, DJUL, (DAY, MONTH, YEAR, (C(1), U(1)), 1, 1, 4) |                | MOPL0311 | 68  |
| 212 | C END PLOT FILE IF NO MORE INPUT DATA ON TAPE                     |                | MOPL0312 |     |
| 213 | IF (DJUL, 19, 999, 0) GO TO 12                                    |                | MOPL0313 | 76  |
| 214 | C SKIP OVER TO NEXT RECORD IF DATA NOT WITHIN DATES REQUESTED     |                | MOPL0314 |     |
| 215 | IF (DJUL, LT, BEGIN) GO TO 11                                     |                | MOPL0315 | 79  |
| 216 | IF (DJUL, GT, FINIS) GO TO 12                                     |                | MOPL0316 | 82  |
| 217 | IF ((DJUL - EPOCH) / 365.25) EPOCH = EPOCH + 365.25               |                | MOPL0317 | 85  |
| 218 | C SET UP DATA IN PLOT FORMAT                                      |                | MOPL0318 |     |
| 219 | X = (DJUL - (EPOCH + F(1) * NDA)) / 365.25                        |                | MOPL0319 | 88  |
| 220 | DO 100 TO 1, 2                                                    |                | MOPL0320 | 89  |
| 221 | IF (C(1), LT, 24, 0) GO TO 11                                     |                | MOPL0321 | 90  |
| 222 | C MAKE SURE INTERVAL IS BETWEEN -3.0 AND 23.0 HRS, U.T.           |                | MOPL0322 |     |
| 223 | IF (C(1), LT, 13, 0) GO TO 18                                     |                | MOPL0323 | 93  |
| 224 | C(1) = C(1) - 24, 0                                               |                | MOPL0324 | 96  |
| 225 | D(1) = D(1) - 24, 0                                               |                | MOPL0325 | 97  |
| 226 | C MOVE X-AXIS TO POSITION FOR NEXT DAY                            |                | MOPL0326 |     |
| 227 | X = X + .04                                                       |                | MOPL0327 | 98  |
| 228 | IF (C(1), LT, (-3, 0)) C(1) = -3, 0                               |                | MOPL0328 | 99  |
| 229 | 23 Y = C(1) / 2, 0                                                |                | MOPL0329 | 102 |
| 230 | N = (D(1) - C(1)) / 2, 0                                          |                | MOPL0330 | 103 |
| 231 | C DENSITY PLOT IF 8 POSITION IS OFF LOWER END OF SCALE            |                | MOPL0331 |     |
| 232 | IF (N, LT, 0, 001) GO TO 106                                      |                | MOPL0332 | 104 |
| 233 | CALL BAR(X, Y, 0, 8, H, 12, Y, 8, X)                              |                | MOPL0333 | 107 |
| 234 | C MOVE X-AXIS POSITION BACK IF IT HAS BEEN MOVED AHEAD            |                | MOPL0334 |     |
| 235 | 106 IF (C(1), LT, 0, 0) X = X - .04                               |                | MOPL0335 | 108 |
| 236 | C END PLOT FILE                                                   |                | MOPL0336 |     |
| 237 | 22 CALL PLOT(15, 0, 6, 0, 999)                                    |                | MOPL0337 | 112 |
| 238 | RETURN                                                            |                | MOPL0338 | 113 |
| 239 | 1000 FORMAT (F10, 2, 12, A30, 10, F12, X, 7)                      |                | MOPL0339 | 114 |
| 240 | 1001 FORMAT (F10, 2)                                              |                | MOPL0340 | 114 |
| 241 | END                                                               |                | MOPL0341 | 114 |

09# TODAY DOES NOT APPEAR IN HEADY DATA; COMMON OR LEFT OF EQUALS (\*)

67906 02 09-25-72 12,322 SUBROUTINE M0PLY

\*\*\*\*\*MONTHLY PLOT ROUTINE\*\*\*\*\*

## PREFACE

PROGRAM BREAK 1423

COMMON LENGTH 0

V COUNT DIVS 5

PRIMARY SYMDEF ENYRW

MOUNT 0

SECONDARY SYMDEF ENYRW

BLOCK LENGTH

1 BLOCK 22

2 BLOCK2 8

3 BLOCK 8

4 BLOCK 10

5 BLOCK 10

6 BLOCK 100

7 BLOCK 8

## SYMDEF

10 BAR

11 DAY

12 PLBY

13 ,PBYV,

14 ,PBYD,

15 ,PBYN,

16 ,PBYT,

17 MONTHS

20 NUMBER

21 SYMBOL

1423 IS THE NEXT AVAILABLE LOCATION.

CHAP VERSION/ASSEMBLY DATES JHRA 050171/052521 JHRB 056171/052521 JMPC 050171/052521

THERE WERE 80 WARNING FLAGS IN THE ABOVE ASSEMBLY

\*\* 19688 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY?

67906 02 09-25-72 12,322 MONTHLY CALENDAR PLOT ROUTINE

\*\*\*\*\*SUBROUTINE M0CALN \*\*\*\*\*

1 M0CALN MONTHLY CALENDAR PLOT ROUTINE M0CA0001

2 C\*\*\*\*\*SUBROUTINE M0CALN \*\*\*\*\*M0CA0002

3 C M0CA0003

4 C\*\*\*\*\*START OF DOCUMENTATION CARDS\*\*\*\*\*M0CA0004

5 C M0CA0005

6 C\*\*\*\*\*NAGA WALLOPS VERSION OF 01X01/69 M0CA0006

7 C M0CA0007

8 C\*\*\*\*\*LANGUAGE-COCTRAN IV M0CA0008

9 C M0CA0009

10 C\*\*\*\*\*MACHINE-GE 625 M0CA0010

11 C M0CA0011

12 C\*\*\*\*\*PURPOSE. M0CA0012

13 C TO PLOT A GRID ON TWELVE INCH PAPER REPRESENTING EACH M0CA0013

14 C DAY OF THE MONTH. EACH LINE DRAWN FROM THE ABSCISSA REPRESENTS M0CA0014

15 C A DAY OR 24HRS. M0CA0015

16 C M0CA0016

17 C\*\*\*\*\*METHOD. M0CA0017

18 C USING TWELVE INCH PAPER,GRIDS FOR THE DAYS ARE DRAWN TO A SCALE M0CA0018

19 C FACTOR OF 20 LINES PER 3 INCHES USING THE LIBRARY PLOT ROUTINES M0CA0019

20 C M0CA0020

21 C\*\*\*\*\*INPUTS M0CA0021

22 C NONE M0CA0022



[illegible]

|           |    |
|-----------|----|
| MOCA00997 | 26 |
| MOCA00998 | 27 |
| MOCA00999 | 28 |

23001 WORDS OF MEMORY USED BY THIS COMPIATION

\*\*\*\*\*ROUTINE MSGALN\*\*\*\*\*

06 19205 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY.

SNUGS = 67986, ACTIVITY = 03, REPORT CODE = 76, RECORD COUNT = 00206

67986 ON 69-25-72 13,400 THIS ROUTINE FETCHES THE NEXT CARD IMAGE

FROM THE IO BUFFER

# REFPAGE

PROGRAM BREAK 320

COMMON LENGTH 8

V COUNT BITS 5

PRIMARY SYNDIC ENTRY

NXCARD 8

SECONDARY SYNDIC ENTRY

BLOCK LENGTH

SUBREF

1 PDHBP

2 ,FRDD,

3 ,PRVN,

4 ,PDDI,

```

1 *
2 *****SUBROUTINE NXCARD *****NXCARD0001
3 *
4 *   PROGRAM IDENTIFICATIONNXCARD0002
5 *
6 *   PROGRAM TITLE = NXCARDNXCARD0003
7 *   PROGRAM NO. = 1.1.2304NXCARD0004
8 *   PROGRAMMED BY = THOMAS WAGNERNXCARD0005
9 *
10 *   COMPUTER REQUIRED = GE 625/635NXCARD0006
11 *   MEMORY REQUIRED = 26 WORDSNXCARD0007
12 *   PERIPHERALS = CARD READERNXCARD0008
13 *   PROGRAM LANGUAGE = GMAPNXCARD0009
14 *
15 *   PURPOSENXCARD0010
16 *
17 *   NXCARD ALLOWS THE USER TO EXAMINE THE NEXT LOGICAL RECORDNXCARD0011
18 *   REWINDING ON FILE 05, THIS NEXT RECORD WILL NOT ACTUALLYNXCARD0012
19 *   BE USED AS AN INPUT RECORD UNTIL IT IS REFERENCED BY A NXCARD0013
20 *   NORMAL FORTRAN READ STATEMENT;NXCARD0014
21 *
22 *   KEYWORDNXCARD0015
23 *
24 *   THE NEXT LOGICAL RECORD IS EXAMINED USING THE SYSTEMNXCARD0016
25 *   SUBROUTINE, FRDD, AFTER THE NEXT LOGICAL RECORD HAS BEENNXCARD0017
26 *   OUTPUT TO THE CALLING PROGRAM, THE CURRENT RECORD INDEX ISNXCARD0018
27 *   RESET TO ITS PREVIOUS VALUE AND A NORMAL RETURN IS EXECUTED,NXCARD0019
28 *
29 *   RESTRICTIONSNXCARD0020
30 *
31 *   1. THE FORMAT USED TO CONVERT THE NEXT CARD MUST HAVE ONLY A NXCARD0021
32 *   TYPE FIELDS AND MUST READ ONLY ONE LOGICAL RECORD.NXCARD0022
33 *
34 *   2. USE ONLY SINGLE OR NONSUBSCRIPTED OUTPUT ARRAY NAMES ASNXCARD0023
35 *   ARGUMENTS TO THIS SUBROUTINE.NXCARD0024
36 *
37 *   3. ENTER THE INTEGER 1 IN THE FIELD WHICH SPECIFIES THE NXCARD0025
38 *   ARRAY SIZE WHENEVER THE OUTPUT ARRAY NAME IS AN UNDIMEN- NXCARD0026
39 *   SIONED VARIABLE,NXCARD0027
40 *
41 *   4. THE INPUT FILE MUST HAVE BEEN PREVIOUSLY OPENED BY A NXCARD0028
42 *   NORMAL FORTRAN READ BEFORE THIS SUBROUTINE IS CALLED FOR NXCARD0029
43 *   THE FIRST TIME.NXCARD0030
44 *
45 *   INPUT/OUTPUTNXCARD0031
46 *
47 *   CALLING SEQUENCE ... CALL NXCARD(FORMAT,A,I,B,J,?,?) WHERE NXCARD0032
48 *
49 *   FORMAT = THE NAME OF THE ARRAY CONTAINING THE BCD FORMAT NXCARD0033
50 *   USED IN DECODING THE NEXT LOGICAL RECORD.NXCARD0034
51 *
52 *   A = THE NAME OF THE FIRST OUTPUT ARRAY AND NXCARD0035
53 *   I = THE LENGTH OF ARRAY A? NXCARD0036
54 *
55 *   B = THE NAME OF THE SECOND OUTPUT ARRAY AND NXCARD0037

```

**GARRON LINKAGE**

000007 000000000000 000  
000010 496723213124 000

## LITERAL

000012 797777007777 000  
000013 529353535853 000

124 END

Nx040124

114 IS THE NEXT AVAILABLE LOCATION,  
CHAP VERSION/ASSEMBLY DATES JHPA 090171/052571 JHMB 090171/052571 JHPC 050171/052571  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

07906 03 09-25-72 18,489 THIS ROUTINE FETCHES THE NEXT CARD IMAGE

SYMBOL REFERENCE BY ALTER NO.

|     |         |     |     |     |     |     |     |
|-----|---------|-----|-----|-----|-----|-----|-----|
| 74  | EDDSM   | 113 | 88  | 113 |     |     |     |
| 100 | EGAIN   | 117 | 111 | 117 |     |     |     |
| 76  | BUFR2   | 118 | 90  | 119 |     |     |     |
| 106 | WIVE    | 123 | 104 | 123 |     |     |     |
| 31  | ROUND   | 88  | 80  | 88  |     |     |     |
| 62  | ENPUY   | 109 | 107 | 108 | 109 |     |     |
| 104 | ENSEBY  | 121 | 100 | 121 |     |     |     |
| 56  | ENST2   | 105 | 101 | 105 | 110 | 119 | 120 |
| 107 | GE, L1, | 72  | 85  | 108 | 109 | 112 |     |
| 2   | PRDD,   | 104 |     |     |     |     |     |
| 3   | PRTH,   | 112 |     |     |     |     |     |
| 4   | PSLT,   | 109 |     |     |     |     |     |
| 0   | HXCARD  | 72  | 72  | 86  | 110 |     |     |
| 1   | RDUME   | 85  |     |     |     |     |     |
| 36  | READY   | 93  | 87  | 93  |     |     |     |
| 30  | SKIP    | 89  | 87  | 91  |     |     |     |
| 11  | STARY   | 74  | 74  | 92  |     |     |     |
| 22  | STOP    | 88  | 78  | 83  | 99  |     |     |

0\* 10217 WORDS OF MEMORY WERE USED BY CHAP FOR THIS ASSEMBLY



PROGRAM TO GIVE MONTH, DAY, YEAR OF PRESENT DAY

|               |    |
|---------------|----|
| PROGRAM BREAK | 27 |
| COMMON LENGTH | 0  |
| V COUNT QTVB  | 9  |

**DAVE**

| BLK | LENGTH |
|-----|--------|
| 1   | 10     |
| 2   | 10     |
| 3   | 10     |
| 4   | 10     |
| 5   | 10     |
| 6   | 10     |
| 7   | 10     |
| 8   | 10     |
| 9   | 10     |
| 10  | 10     |
| 11  | 10     |
| 12  | 10     |
| 13  | 10     |
| 14  | 10     |
| 15  | 10     |
| 16  | 10     |
| 17  | 10     |
| 18  | 10     |
| 19  | 10     |
| 20  | 10     |
| 21  | 10     |
| 22  | 10     |
| 23  | 10     |
| 24  | 10     |
| 25  | 10     |
| 26  | 10     |
| 27  | 10     |
| 28  | 10     |
| 29  | 10     |
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| 66  | 10     |
| 67  | 10     |
| 68  | 10     |
| 69  | 10     |
| 70  | 10     |
| 71  | 10     |
| 72  | 10     |
| 73  | 10     |
| 74  | 10     |
| 75  | 10     |
| 76  | 10     |
| 77  | 10     |
| 78  | 10     |
| 79  | 10     |
| 80  | 10     |
| 81  | 10     |
| 82  | 10     |
| 83  | 10     |
| 84  | 10     |
| 85  | 10     |
| 86  | 10     |
| 87  | 10     |
| 88  | 10     |
| 89  | 10     |
| 90  | 10     |
| 91  | 10     |
| 92  | 10     |
| 93  | 10     |
| 94  | 10     |
| 95  | 10     |
| 96  | 10     |
| 97  | 10     |
| 98  | 10     |
| 99  | 10     |
| 100 | 10     |

## SUMMARY

PROGRAM TO GIVE MONTH, DAY, YEAR OF PRESENT DAY

```

1 *
2 * .....SUBROUTINE DATE..... DATE0001
3 * ..... DATE0002
4 * .....START OF DOCUMENTATION COMMENT CARDS..... DATE0004
5 * ..... DATE0005
6 * PROGRAM IDENTIFICATION DATE0006
7 * ..... DATE0007
8 * PROGRAM TITLE = DATE DATE0008
9 * PROGRAMMED BY = DENNIS MELVIN DATE0009
10 * COMPUTER REQUIRED = GE 625 DATE0010
11 * PROGRAM LANGUAGE = GMAP DATE0011
12 * ..... DATE0012
13 * PURPOSE DATE0013
14 * ..... DATE0014
15 * DATE RECORDS THE CURRENT DATE AS STORED WITHIN THE DATE0015
16 * COMPUTER SYSTEM. DATE0016
17 * ..... DATE0017
18 * METHOD DATE0018
19 * ..... DATE0019
20 * THIS ROUTINE FETCHES THE DATE BY USING THE MASTER MODE DATE0020
21 * ENTRY INSTRUCTION--GETIME--THE DATE IS THEN PROPERLY DATE0021
22 * FORMATTED FOR THE PLOT ROUTINES FOR PROGRAM 1.1.1615, DATE0022
23 * BICWINJON, DATE0023
24 * ..... DATE0024
25 * INPUT/OUTPUT DATE0025
26 * ..... DATE0026
27 * CALLING SEQUENCE...CALL DATE(TODAY) WHERE DATE0027
28 * TODAY = THE PROPERLY FORMATTED CURRENT DATE, TODAY IS OF DATE0028
29 * DIMENSION 2. DATE0029
30 * ..... DATE0030
31 * .....END OF DOCUMENTATION COMMENT CARDS..... DATE0031
32 * ..... DATE0032
33 * _BL DATE DATE0033

```

PROGRAM TO GIVE MONTH, DAY, YEAR OF PRESENT DAY

[illegible]

|        |                  |     |
|--------|------------------|-----|
| JQUC24 | 0000000000000000 | 000 |
| 020025 | 24416325432      | 000 |

## LITERALS

000026 00002022020 000 51 END DATE0051  
 27 IS THE NEXT AVAILABLE LOCATION.  
 GHAP VERSION/ASSEMBLY DATES JHPA 110171/102971 JHPB 110171/102971 JHPC 110171/102971  
 THERE WERE 1 WARNING FLAG IN THE ABOVE ASSEMBLY  
 ON PAGE NO. 3

67906 04 09-25-72 18,452 PROGRAM TO GIVE MONTH, DAY, YEAR OF PRESENT DAY

001AL SYMBOL REFERENCES BY ALTER NO.

|    |        |    |    |    |
|----|--------|----|----|----|
| 0  | DATE   | 37 | 37 | 50 |
| 21 | GETIME |    | 58 |    |
| 23 | SE,LL  |    | 37 |    |

\*\* 18185 WORDS OF MEMORY WERE USED BY GHAP FOR THIS ASSEMBLY

SNUM = 67906, ACTIVITY = 6 05, REPORT CODE = F4, RECORD COUNT = 00687

67906 05 09-25-72 18,574 1972 EPHEMERIS

| 1  | COPY                                                                   | 1972 EPHEMERIS | DATA | 1  |
|----|------------------------------------------------------------------------|----------------|------|----|
| 2  | SUBROUTINE TABLE                                                       |                | DATA | 2  |
| 3  | DIMENSION RASUN (369), DCSUN (369), RSUN (369)                         |                | DATA | 3  |
| 4  | DIMENSION RAMOON (369), DCMOON (369), RMOON (369)                      |                | DATA | 4  |
| 5  | DIMENSION XARRAY (2216)                                                |                |      |    |
| 6  | DOUBLE PRECISION Y                                                     |                |      |    |
| 7  | EQUIVALENCE (RASUN, ARRAY, DCSUN, ARRAY (370)), (RSUN, ARRAY (789))    |                |      |    |
| 8  | EQUIVALENCE (RAMOON, ARRAY (1406)), (DCMOON, ARRAY (1477))             |                |      |    |
| 9  | EQUIVALENCE (RMOON, ARRAY (1848))                                      |                |      |    |
| 10 | COMMON /EPMO(K/ Y(4))                                                  |                |      |    |
| 11 | Y(1) = ARRY(1)                                                         |                |      |    |
| 12 | Y(2) = ARRY(1+1)                                                       |                |      |    |
| 13 | Y(3) = ARRY(1+2)                                                       |                |      |    |
| 14 | Y(4) = ARRY(1+3)                                                       |                |      |    |
| 15 | RETURN                                                                 |                |      |    |
| 16 | DATA RASUN (1) = 19 361/                                               |                | DATA | 6  |
| 17 | 11 4,8788779E 00, 4,8988711E 00, 4,9188743E 00, 4,9348980E 00, DATA 7  |                |      |    |
| 18 | 12 4,9388178E 00, 4,9788166E 00, 4,9988658E 00, 5,0111286E 00, DATA 8  |                |      |    |
| 19 | 13 5,0388234E 00, 5,0493030E 00, 5,0663409E 00, 5,0878392E 00, DATA 9  |                |      |    |
| 20 | 14 5,1066991E 00, 5,1282176E 00, 5,1440898E 00, 5,1662916E 00, DATA 10 |                |      |    |
| 21 | 15 5,1881700E 00, 5,2084873E 00, 5,2191150E 00, 5,2377482E 00, DATA 11 |                |      |    |
| 22 | 16 5,2572232E 00, 5,2762458E 00, 5,2933119E 00, 5,3117223E 00, DATA 12 |                |      |    |
| 23 | 17 5,3308737E 00, 5,3483679E 00, 5,3666036E 00, 5,3847883E 00, DATA 13 |                |      |    |
| 24 | 18 5,4028976E 00, 5,4209553E 00, 5,4389533E 00, 5,4568915E 00, DATA 14 |                |      |    |
| 25 | 19 5,4747703E 00, 5,4925898E 00, 5,5103503E 00, 5,5280522E 00, DATA 15 |                |      |    |
| 26 | DATA RASUN (1) = 871 72/                                               |                | DATA | 16 |
| 27 | 21 5,5488958E 00, 5,5632814E 00, 5,5888094E 00, 5,5982807E 00, DATA 17 |                |      |    |
| 28 | 22 5,6158950E 00, 5,6380532E 00, 5,6588553E 00, 5,6676029E 00, DATA 18 |                |      |    |
| 29 | 23 5,6849932E 00, 5,7049888E 00, 5,7190124E 00, 5,7360487E 00, DATA 19 |                |      |    |
| 30 | 24 5,7338156E 00, 5,7699879E 00, 5,7888084E 00, 5,8038280E 00, DATA 20 |                |      |    |
| 31 | 25 5,8203974E 00, 5,8371172E 00, 5,8537898E 00, 5,8704190E 00, DATA 21 |                |      |    |
| 32 | 26 5,8869943E 00, 5,9035298E 00, 5,9200205E 00, 5,9328798E 00, DATA 22 |                |      |    |
| 33 | 27 5,9692589E 00, 5,9855858E 00, 5,9038837E 00, 6,0181486E 00, DATA 23 |                |      |    |
| 34 | 28 6,0343814E 00, 6,0505836E 00, 6,0667567E 00, 6,0829021E 00, DATA 24 |                |      |    |
| 35 | 29 6,0998215E 00, 6,1151126E 00, 6,1351872E 00, 6,1472381E 00, DATA 25 |                |      |    |
| 36 | DATA RASUN (1) = 7371881/                                              |                | DATA | 26 |
| 37 | 31 6,1832684E 00, 6,1792730E 00, 6,1922632E 00, 6,2112383E 00, DATA 27 |                |      |    |
| 38 | 32 6,2271937E 00, 6,2481365E 00, 6,2590661E 00, 6,2749888E 00, DATA 28 |                |      |    |
| 39 | 33 7,0052082E-03, 6,3882448E-02, 6,9491378E-02, 5,5378987E-02, DATA 29 |                |      |    |
| 40 | 34 7,2251157E-02, 6,7124688E-02, 6,8299614E-01, 1,1886784E-01, DATA 30 |                |      |    |
| 41 | 35 1,8474028E-01, 1,5861635E-01, 1,6649735E-01, 1,8238495E-01, DATA 31 |                |      |    |
| 42 | 36 1,9828040E-01, 1,1478646E-01, 1,3510349E-01, 2,4603382E-01, DATA 32 |                |      |    |
| 43 | 37 2,6197984E-01, 1,7743749E-01, 2,9391427E-01, 3,0998921E-01, DATA 33 |                |      |    |
| 44 | 38 3,8592373E-01, 1,4195879E-01, 1,5881548E-01, 3,7409490E-01, DATA 34 |                |      |    |
| 45 | 39 3,9017819E-01, 1,8882619E-01, 1,2257962E-01, 4,1386592E-01, DATA 35 |                |      |    |
| 46 | DATA RASUN (1) = 1897144/                                              |                | DATA | 36 |
| 47 | 41 4,8486583E-01, 4,7289917E-01, 4,8736125E-01, 5,0836524E-01, DATA 37 |                |      |    |
| 48 | 42 5,0977380E-01, 5,3882588E-01, 5,5211018E-01, 5,6912782E-01, DATA 38 |                |      |    |
| 49 | 43 5,8559940E-01, 6,0286444E-01, 6,1888974E-01, 6,3591302E-01, DATA 39 |                |      |    |
| 50 | 44 6,5174843E-01, 6,6885988E-01, 6,8534887E-01, 7,0178097E-01, DATA 40 |                |      |    |
| 51 | 45 7,1285811E-01, 7,3533758E-01, 7,5217868E-01, 7,6906280E-01, DATA 41 |                |      |    |
| 52 | 46 7,8598799E-01, 8,0295666E-01, 8,1996822E-01, 8,3708247E-01, DATA 42 |                |      |    |
| 53 | 47 8,9412817E-01, 8,7128028E-01, 8,8864827E-01, 9,0566511E-01, DATA 43 |                |      |    |
| 54 | 48 9,2292987E-01, 9,4623866E-01, 9,5727702E-01, 9,7495916E-01, DATA 44 |                |      |    |
| 55 | 49 9,9237938E-01, 1,0698837E 00, 1,0233329E 00, 1,0844864E 00, DATA 45 |                |      |    |
| 56 | DATA RASUN (1) = 1497180/                                              |                | DATA | 46 |
| 57 | 51 1,0828384E 00, 1,080395E 00, 1,0976802E 00, 1,1115355E 00, DATA 47  |                |      |    |
| 58 | 52 1,1258652E 00, 1,1388083E 00, 1,1685842E 00, 1,1868592E 00, DATA 48 |                |      |    |
| 59 | 53 1,1802385E 00, 1,2280998E 00, 1,2399964E 00, 1,2579217E 00, DATA 49 |                |      |    |
| 60 | 54 1,2758737E 00, 1,2938512E 00, 1,3118539E 00, 1,3298715E 00, DATA 50 |                |      |    |
| 61 | 55 1,3449256E 00, 1,3689899E 00, 1,3880722E 00, 1,4021786E 00, DATA 51 |                |      |    |
| 62 | 56 1,4282832E 00, 1,4384049E 00, 1,4555568E 00, 1,4748799E 00, DATA 52 |                |      |    |
| 63 | 57 1,4928261E 00, 1,5149879E 00, 1,5291178E 00, 1,5472678E 00, DATA 53 |                |      |    |
| 64 | 58 1,5888188E 00, 1,5888638E 00, 1,6057048E 00, 1,6198488E 00, DATA 54 |                |      |    |
| 65 | 59 1,6379692E 00, 1,6500688E 00, 1,6741988E 00, 1,6928993E 00, DATA 55 |                |      |    |
| 66 | DATA RASUN (1) = 1817226/                                              |                | DATA | 56 |
| 67 | 61 1,7103792E 00, 1,7284488E 00, 1,7465018E 00, 1,7645389E 00, DATA 57 |                |      |    |
| 68 | 62 1,7825539E 00, 1,8085569E 00, 1,8182268E 00, 1,8364777E 00, DATA 58 |                |      |    |
| 69 | 63 1,8544090E 00, 1,8725125E 00, 1,8991867E 00, 1,9088397E 00, DATA 59 |                |      |    |



|     |                             |                 |      |                 |      |                  |      |                 |      |      |      |     |
|-----|-----------------------------|-----------------|------|-----------------|------|------------------|------|-----------------|------|------|------|-----|
| 70  | 44                          | 1:9250558E      | 00.  | 0.9486855E      | 000  | 0.9463852E       | 001  | 1:9790995E      | 00.  | DATA | 60   |     |
| 71  | 65                          | 1:9909772E      | 00.  | 0.8144170E      | 000  | 0.8080154E       | 001  | 2:0499804E      | 00.  | DATA | 61   |     |
| 72  | 66                          | 2:0071023E      | 00.  | 0.8045032E      | 000  | 0.8000220E       | 001  | 2:1194203E      | 00.  | DATA | 62   |     |
| 73  | 67                          | 2:0069993E      | 00.  | 0.1540070E      | 000  | 0.1713560E       | 002  | 2:1885822E      | 00.  | DATA | 63   |     |
| 74  | 68                          | 2:0097683E      | 00.  | 0.2209027E      | 000  | 0.2399977E       | 002  | 2:2578494E      | 00.  | DATA | 64   |     |
| 75  | 69                          | 2:0740540E      | 00.  | 0.2290239E      | 000  | 0.3679473E       | 002  | 2:3240200E      | 00.  | DATA | 65   |     |
| 76  | DATA (IRANUM (I)I=207202)/  |                 |      |                 |      |                  |      |                 |      |      | DATA | 66  |
| 77  | 71                          | 2:0410008E      | 00.  | 0.3504632E      | 000  | 0.3782175E       | 001  | 2:3919292E      | 00.  | DATA | 67   |     |
| 78  | 72                          | 2:4009905E      | 00.  | 0.4252253E      | 000  | 0.4480097E       | 001  | 2:4580539E      | 00.  | DATA | 68   |     |
| 79  | 73                          | 2:4740322E      | 00.  | 0.4983210E      | 000  | 0.5077299E       | 002  | 2:5241007E      | 00.  | DATA | 69   |     |
| 80  | 74                          | 2:5400446E      | 00.  | 0.5507435E      | 000  | 0.5730042E       | 002  | 2:5892274E      | 00.  | DATA | 70   |     |
| 81  | 75                          | 2:6054100E      | 00.  | 0.6225640E      | 000  | 0.6336807E       | 002  | 2:6537603E      | 00.  | DATA | 71   |     |
| 82  | 76                          | 2:6098330E      | 00.  | 0.6800315E      | 000  | 0.7082009E       | 002  | 2:7177800E      | 00.  | DATA | 72   |     |
| 83  | 77                          | 2:7339132E      | 00.  | 0.7496200E      | 000  | 0.7655044E       | 002  | 2:7813692E      | 00.  | DATA | 73   |     |
| 84  | 78                          | 2:7972018E      | 00.  | 0.8100240E      | 000  | 0.8208230E       | 002  | 2:8446053E      | 00.  | DATA | 74   |     |
| 85  | 79                          | 2:8003615E      | 00.  | 0.8701172E      | 000  | 0.8900504E       | 001  | 2:9075693E      | 00.  | DATA | 75   |     |
| 86  | DATA (IRANUM (I)I=2097200)/ |                 |      |                 |      |                  |      |                 |      |      | DATA | 76  |
| 87  | 81                          | 2:9232733E      | 00.  | 0.9389692E      | 000  | 0.9506530E       | 002  | 2:9703208E      | 00.  | DATA | 77   |     |
| 88  | 82                          | 2:9899939E      | 00.  | 0.000564E       | 000  | 0.0123217E       | 002  | 3:0329600E      | 00.  | DATA | 78   |     |
| 89  | 83                          | 3:0400117E      | 00.  | 0.0242595E      | 000  | 0.0799072E       | 002  | 3:0955506E      | 00.  | DATA | 79   |     |
| 90  | 84                          | 3:1112094E      | 00.  | 0.1208075E      | 000  | 0.1405522E       | 001  | 3:1582097E      | 00.  | DATA | 80   |     |
| 91  | 85                          | 3:2738900E      | 00.  | 0.1895869E      | 000  | 0.2002982E       | 001  | 3:2210297E      | 00.  | DATA | 81   |     |
| 92  | 86                          | 3:2509720E      | 00.  | 0.2505332E      | 000  | 0.2603204E       | 001  | 3:2804322E      | 00.  | DATA | 82   |     |
| 93  | 87                          | 3:2999573E      | 00.  | 0.3100119E      | 000  | 0.3304929E       | 002  | 3:3470092E      | 00.  | DATA | 83   |     |
| 94  | 88                          | 3:3639355E      | 00.  | 0.3795026E      | 000  | 0.3904997E       | 002  | 3:4113291E      | 00.  | DATA | 84   |     |
| 95  | 89                          | 3:4278928E      | 00.  | 0.4406892E      | 000  | 0.4598222E       | 002  | 3:4759921E      | 00.  | DATA | 85   |     |
| 96  | DATA (IRANUM (I)I=2099324)/ |                 |      |                 |      |                  |      |                 |      |      | DATA | 86  |
| 97  | 91                          | 3:4922001E      | 00.  | 0.5004473E      | 000  | 0.5207340E       | 001  | 3:5410639E      | 00.  | DATA | 87   |     |
| 98  | 92                          | 3:5574328E      | 00.  | 0.5788519E      | 000  | 0.5900339E       | 001  | 3:6068204E      | 00.  | DATA | 88   |     |
| 99  | 93                          | 3:6233816E      | 00.  | 0.6399902E      | 000  | 0.6506509E       | 001  | 3:6738608E      | 00.  | DATA | 89   |     |
| 100 | 94                          | 3:6901336E      | 00.  | 0.7009542E      | 000  | 0.7200339E       | 002  | 3:7407693E      | 00.  | DATA | 90   |     |
| 101 | 95                          | 3:7577629E      | 00.  | 0.7740149E      | 000  | 0.7909263E       | 001  | 3:8098909E      | 00.  | DATA | 91   |     |
| 102 | 96                          | 3:8263279E      | 00.  | 0.8400198E      | 000  | 0.8609915E       | 002  | 3:8783866E      | 00.  | DATA | 92   |     |
| 103 | 97                          | 3:8958588E      | 00.  | 0.9103939E      | 000  | 0.9309902E       | 002  | 3:9486471E      | 00.  | DATA | 93   |     |
| 104 | 98                          | 3:9663649E      | 00.  | 0.9801432E      | 000  | 0.0009810E       | 002  | 4:0198800E      | 00.  | DATA | 94   |     |
| 105 | 99                          | 4:0378312E      | 00.  | 0.0500999E      | 000  | 0.0709334E       | 002  | 4:0920793E      | 00.  | DATA | 95   |     |
| 106 | DATA (IRANUM (I)I=3029360)/ |                 |      |                 |      |                  |      |                 |      |      | DATA | 96  |
| 107 | 101                         | 4:1026633E      | 00.  | 0.120024E       | 000  | 0.1408352E       | 002  | 4:1652012E      | 00.  | DATA | 97   |     |
| 108 | 102                         | 4:1836371E      | 00.  | 0.2001230E      | 000  | 0.2204665E       | 002  | 4:2392601E      | 00.  | DATA | 98   |     |
| 109 | 103                         | 4:2579139E      | 00.  | 0.2706205E      | 000  | 0.2903767E       | 001  | 4:3141038E      | 00.  | DATA | 99   |     |
| 110 | 104                         | 4:330374E       | 00.  | 0.3503380E      | 000  | 0.3708659E       | 002  | 4:3898700E      | 00.  | DATA | 100  |     |
| 111 | 105                         | 4:4009038E      | 00.  | 0.4299722E      | 000  | 0.4407697E       | 002  | 4:4662195E      | 00.  | DATA | 101  |     |
| 112 | 106                         | 4:4803858E      | 00.  | 0.5005852E      | 000  | 0.5208117E       | 002  | 4:5436629E      | 00.  | DATA | 102  |     |
| 113 | 107                         | 4:5623844E      | 00.  | 0.5802608E      | 000  | 0.6009860E       | 002  | 4:6202623E      | 00.  | DATA | 103  |     |
| 114 | 108                         | 4:6398008E      | 00.  | 0.6509502E      | 000  | 0.6703092E       | 002  | 4:6978784E      | 00.  | DATA | 104  |     |
| 115 | 109                         | 4:7178423E      | 00.  | 0.7304163E      | 000  | 0.7507084E       | 001  | 4:7751501E      | 00.  | DATA | 105  |     |
| 116 | DATA (IRANUM (I)I=3019800)/ |                 |      |                 |      |                  |      |                 |      |      | DATA | 106 |
| 117 | 111                         | 4:7949237E      | 00.  | 0.8100824E      | 000  | 0.8302322E       | 001  | 4:8525703E      | 00.  | DATA | 107  |     |
| 118 | 112                         | 4:8710987E      | 00.  | 0.8902026E      | 000  | 0.9104910E       | 001  | 4:9297593E      | 00.  | DATA | 108  |     |
| 119 | DATA (IRANUM (I)I=30788)/   |                 |      |                 |      |                  |      |                 |      |      | DATA | 109 |
| 120 | 121                         | -4:0429706E-01. | -01. | -0.0303463E-01. | -01. | -0.0167740E-01.  | -01. | -4:0018608E-01. | -01. | DATA | 109  |     |
| 121 | 122                         | -3:9806320E-01. | -01. | -0.0600752E-01. | -01. | -0.0492045E-01.  | -01. | -3:9290287E-01. | -01. | DATA | 110  |     |
| 122 | 123                         | -3:9079589E-01. | -01. | -0.0807989E-01. | -01. | -0.0607657E-01.  | -01. | -3:8546920E-01. | -01. | DATA | 111  |     |
| 123 | 124                         | -3:8089215E-01. | -01. | -0.1001358E-01. | -01. | -0.0701252E-01.  | -01. | -3:7217071E-01. | -01. | DATA | 112  |     |
| 124 | 125                         | -3:6904960E-01. | -01. | -0.1398958E-01. | -01. | -0.10241374E-01. | -01. | -3:5892322E-01. | -01. | DATA | 113  |     |
| 125 | 126                         | -3:5531981E-01. | -01. | -0.1808470E-01. | -01. | -0.14710010E-01. | -01. | -3:4364714E-01. | -01. | DATA | 114  |     |
| 126 | 127                         | -3:3900926E-01. | -01. | -0.2306662E-01. | -01. | -0.1812160E-01.  | -01. | -3:2707674E-01. | -01. | DATA | 115  |     |
| 127 | 128                         | -3:2203380E-01. | -01. | -0.2809070E-01. | -01. | -0.2304449E-01.  | -01. | -3:0872408E-01. | -01. | DATA | 116  |     |
| 128 | 129                         | -3:0508372E-01. | -01. | -0.3309037E-01. | -01. | -0.2809385E-01.  | -01. | -2:8898009E-01. | -01. | DATA | 117  |     |
| 129 | DATA (IRANUM (I)I=30792)/   |                 |      |                 |      |                  |      |                 |      |      | DATA | 118 |
| 130 | 131                         | -2:887397E-01.  | -01. | -0.3808622E-01. | -01. | -0.3305652E-01.  | -01. | -2:6774604E-01. | -01. | DATA | 119  |     |
| 131 | 132                         | -2:8200004E-01. | -01. | -0.4309935E-01. | -01. | -0.3806040E-01.  | -01. | -2:4536394E-01. | -01. | DATA | 120  |     |
| 132 | 133                         | -2:6959283E-01. | -01. | -0.4809582E-01. | -01. | -0.4305539E-01.  | -01. | -2:2189301E-01. | -01. | DATA | 121  |     |
| 133 | 134                         | -2:5807100E-01. | -01. | -0.5309081E-01. | -01. | -0.4805924E-01.  | -01. | -1:9747282E-01. | -01. | DATA | 122  |     |
| 134 | 135                         | -2:4702344E-01. | -01. | -0.5809472E-01. | -01. | -0.5305380E-01.  | -01. | -1:7223486E-01. | -01. | DATA | 123  |     |
| 135 | 136                         | -2:3601270E-01. | -01. | -0.6309490E-01. | -01. | -0.5804782E-01.  | -01. | -1:4797320E-01. | -01. | DATA | 124  |     |
| 136 | 137                         | -2:2501240E-01. | -01. | -0.6808202E-01. | -01. | -0.6304139E-01.  | -01. | -1:2311109E-01. | -01. | DATA | 125  |     |
| 137 | 138                         | -2:1403048E-01. | -01. | -0.7308390E-01. | -01. | -0.6803442E-01.  | -01. | -0:9868963E-01. | -01. | DATA | 126  |     |
| 138 | 139                         | -2:0247389E-01. | -01. | -0.7804702E-01. | -01. | -0.7303240E-01.  | -01. | -0:7404700E-01. | -01. | DATA | 127  |     |
| 139 | DATA (IRANUM (I)I=307200)/  |                 |      |                 |      |                  |      |                 |      |      | DATA | 128 |
| 140 | 141                         | -0.8801199E-02. | -02. | -4.4947945E-02. | -02. | -0.8006917E-02.  | -02. | -3:1160008E-02. | -02. | DATA | 129  |     |
| 141 | 142                         | -0.8801257E-02. | -02. | -4.730641E-02.  | -02. | -0.8403409E-02.  | -02. | -3:2521100E-03. | -03. | DATA | 130  |     |
| 142 | 143                         | 3.845081E-03.   | -03. | 0.8287679E-02.  | -02. | 2.7122710E-02.   | -02. | 2:3998884E-02.  | -02. | DATA | 131  |     |

|     |                             |                |                |                |                |      |      |     |
|-----|-----------------------------|----------------|----------------|----------------|----------------|------|------|-----|
| 143 | 144                         | 3.0844389E-02  | 5.797666E-02   | 0.4587138E-02  | 5.1381206E-02  | DATA | 132  |     |
| 144 | 145                         | 3.0188329E-02  | 5.499692E-02   | 7.1785424E-02  | 7.0498287E-02  | DATA | 133  |     |
| 145 | 146                         | 3.5213823E-02  | 7.194346E-02   | 9.8564787E-02  | 1.0523093E-01  | DATA | 134  |     |
| 146 | 147                         | 1.2184533E-01  | 1.1842828E-01  | 2.2497808E-01  | 1.3149279E-01  | DATA | 135  |     |
| 147 | 148                         | 1.8997136E-01  | 1.444113E-01   | 2.9081119E-01  | 1.716924E-01   | DATA | 136  |     |
| 148 | 149                         | 1.8340350E-01  | 1.699525E-01   | 2.759745E-01   | 1.821478E-01   | DATA | 137  |     |
| 149 | DATA (DCSUN (I):I=1099244)/ |                |                |                |                |      | DATA | 138 |
| 150 | 151                         | 1.8627087E-01  | 1.948404E-01   | 2.655698E-01   | 2.8633781E-01  | DATA | 139  |     |
| 151 | 152                         | 2.2222183E-01  | 2.1806679E-01  | 2.2385184E-01  | 2.2957529E-01  | DATA | 140  |     |
| 152 | 153                         | 2.8523386E-01  | 2.488315E-01   | 2.4686137E-01  | 2.5182379E-01  | DATA | 141  |     |
| 153 | 154                         | 2.5728737E-01  | 2.625404E-01   | 2.6729167E-01  | 2.7296996E-01  | DATA | 142  |     |
| 154 | 155                         | 2.9807284E-01  | 2.838993E-01   | 2.8894807E-01  | 2.9291784E-01  | DATA | 143  |     |
| 155 | 156                         | 2.9778585E-01  | 2.8241139E-01  | 2.8783805E-01  | 3.1156988E-01  | DATA | 144  |     |
| 156 | 157                         | 3.2681813E-01  | 3.2887868E-01  | 3.244928E-01   | 3.2882892E-01  | DATA | 145  |     |
| 157 | 158                         | 3.8294492E-01  | 3.3690715E-01  | 3.468088E-01   | 3.4460375E-01  | DATA | 146  |     |
| 158 | 159                         | 3.4838550E-01  | 3.529079E-01   | 3.558099E-01   | 3.588108E-01   | DATA | 147  |     |
| 159 | DATA (DCSUN (I):I=1459100)/ |                |                |                |                |      | DATA | 148 |
| 160 | 161                         | 3.6210884E-01  | 3.658920E-01   | 3.6839134E-01  | 3.713748E-01   | DATA | 149  |     |
| 161 | 162                         | 3.7425188E-01  | 3.778208E-01   | 3.7958127E-01  | 3.822327E-01   | DATA | 150  |     |
| 162 | 163                         | 3.8469259E-01  | 3.878015E-01   | 3.8981828E-01  | 3.9132187E-01  | DATA | 151  |     |
| 163 | 164                         | 3.933116E-01   | 3.95838E-01    | 3.969449E-01   | 3.9858780E-01  | DATA | 152  |     |
| 164 | 165                         | 4.011390E-01   | 4.015226E-01   | 4.0281362E-01  | 4.0398651E-01  | DATA | 153  |     |
| 165 | 166                         | 4.0504032E-01  | 4.059756E-01   | 4.067908E-01   | 4.0748671E-01  | DATA | 154  |     |
| 166 | 167                         | 4.0806273E-01  | 4.085186E-01   | 4.088544E-01   | 4.090708E-01   | DATA | 155  |     |
| 167 | 168                         | 4.091655E-01   | 4.092409E-01   | 4.089962E-01   | 4.0873187E-01  | DATA | 156  |     |
| 168 | 169                         | 4.083471E-01   | 4.078486E-01   | 4.0722064E-01  | 4.0647859E-01  | DATA | 157  |     |
| 169 | DATA (DCSUN (I):I=181226)/  |                |                |                |                |      | DATA | 158 |
| 170 | 171                         | 4.058784E-01   | 4.048386E-01   | 4.035413E-01   | 4.0232627E-01  | DATA | 159  |     |
| 171 | 172                         | 4.009434E-01   | 3.995445E-01   | 3.9797897E-01  | 3.9629788E-01  | DATA | 160  |     |
| 172 | 173                         | 3.9438138E-01  | 3.925909E-01   | 3.908671E-01   | 3.8843083E-01  | DATA | 161  |     |
| 173 | 174                         | 3.8619384E-01  | 3.832466E-01   | 3.813565E-01   | 3.7877981E-01  | DATA | 162  |     |
| 174 | 175                         | 3.7309550E-01  | 3.738045E-01   | 3.7040814E-01  | 3.6740784E-01  | DATA | 163  |     |
| 175 | 176                         | 3.6438332E-01  | 3.618971E-01   | 3.579019E-01   | 3.543838E-01   | DATA | 164  |     |
| 176 | 177                         | 3.5087834E-01  | 3.472788E-01   | 3.435773E-01   | 3.397833E-01   | DATA | 165  |     |
| 177 | 178                         | 3.3589673E-01  | 3.319171E-01   | 3.274618E-01   | 3.236854E-01   | DATA | 166  |     |
| 178 | 179                         | 3.294851E-01   | 3.259747E-01   | 3.20755E-01    | 3.1618499E-01  | DATA | 167  |     |
| 179 | DATA (DCSUN (I):I=2477282)/ |                |                |                |                |      | DATA | 168 |
| 180 | 181                         | 3.159215E-01   | 3.168977E-01   | 3.124885E-01   | 3.073092E-01   | DATA | 169  |     |
| 181 | 182                         | 2.87398E-01    | 2.741132E-01   | 2.725849E-01   | 2.672368E-01   | DATA | 170  |     |
| 182 | 183                         | 2.621282E-01   | 2.567385E-01   | 2.513967E-01   | 2.459508E-01   | DATA | 171  |     |
| 183 | 184                         | 2.401584E-01   | 2.349798E-01   | 2.293823E-01   | 2.237848E-01   | DATA | 172  |     |
| 184 | 185                         | 2.280627E-01   | 2.223538E-01   | 2.164065E-01   | 2.105233E-01   | DATA | 173  |     |
| 185 | 186                         | 1.9438834E-01  | 1.880017E-01   | 1.825651E-01   | 1.7648029E-01  | DATA | 174  |     |
| 186 | 187                         | 1.7634797E-01  | 1.641708E-01   | 1.579478E-01   | 1.5168295E-01  | DATA | 175  |     |
| 187 | 188                         | 1.4537675E-01  | 1.398310E-01   | 1.326493E-01   | 1.2628754E-01  | DATA | 176  |     |
| 188 | 189                         | 1.29773E-01    | 1.238598E-01   | 1.167676E-01   | 1.102598E-01   | DATA | 177  |     |
| 189 | DATA (DCSUN (I):I=2537288)/ |                |                |                |                |      | DATA | 178 |
| 190 | 191                         | 9.8844237E-02  | 8.784253E-02   | 8.046376E-02   | 7.3767429E-02  | DATA | 179  |     |
| 191 | 192                         | 6.9077375E-02  | 6.048785E-02   | 5.3780505E-02  | 4.697699E-02   | DATA | 180  |     |
| 192 | 193                         | 4.6238892E-02  | 3.348786E-02   | 2.672547E-02   | 1.9958367E-02  | DATA | 181  |     |
| 193 | 194                         | 1.417897E-02   | 8.88896E-03    | 4.864709E-03   | 7.202678E-03   | DATA | 182  |     |
| 194 | 195                         | -1.400127E-02  | -8.88896E-03   | -7.59959E-03   | -3.439607E-02  | DATA | 183  |     |
| 195 | 196                         | -4.1188774E-02 | -4.799579E-02  | -4.75584E-02   | -6.15236E-02   | DATA | 184  |     |
| 196 | 197                         | -6.8284883E-02 | -9.585107E-02  | -1.762596E-02  | -8.847752E-02  | DATA | 185  |     |
| 197 | 198                         | -9.51740E-02   | -1.828502E-01  | -1.885042E-01  | -1.151348E-01  | DATA | 186  |     |
| 198 | 199                         | -1.2173856E-01 | -1.288150E-01  | -1.348619E-01  | -1.413778E-01  | DATA | 187  |     |
| 199 | DATA (DCSUN (I):I=2897384)/ |                |                |                |                |      | DATA | 188 |
| 200 | 201                         | -1.4785939E-01 | -1.5430629E-01 | -1.607161E-01  | -1.6708785E-01 | DATA | 189  |     |
| 201 | 202                         | -1.7341720E-01 | -1.799048E-01  | -1.859482E-01  | -1.921457E-01  | DATA | 190  |     |
| 202 | 203                         | -1.9829552E-01 | -2.043958E-01  | -2.104449E-01  | -2.1644091E-01 | DATA | 191  |     |
| 203 | 204                         | -2.2238282E-01 | -2.282661E-01  | -2.340913E-01  | -2.398558E-01  | DATA | 192  |     |
| 204 | 205                         | -2.4553647E-01 | -2.511924E-01  | -2.568128E-01  | -2.6228087E-01 | DATA | 193  |     |
| 205 | 206                         | -2.6788928E-01 | -2.738444E-01  | -2.795348E-01  | -2.850578E-01  | DATA | 194  |     |
| 206 | 207                         | -2.8865046E-01 | -2.938925E-01  | -2.985138E-01  | -3.035249E-01  | DATA | 195  |     |
| 207 | 208                         | -3.0831122E-01 | -3.138083E-01  | -3.185143E-01  | -3.221273E-01  | DATA | 196  |     |
| 208 | 209                         | -3.265452E-01  | -3.30868E-01   | -3.3508975E-01 | -3.392325E-01  | DATA | 197  |     |
| 209 | DATA (DCSUN (I):I=3897388)/ |                |                |                |                |      | DATA | 198 |
| 210 | 211                         | -3.4323844E-01 | -3.47598E-01   | -3.5096309E-01 | -3.546689E-01  | DATA | 199  |     |
| 211 | 212                         | -3.582853E-01  | -3.619520E-01  | -3.6552667E-01 | -3.683878E-01  | DATA | 200  |     |
| 212 | 213                         | -3.7133834E-01 | -3.745621E-01  | -3.774724E-01  | -3.802828E-01  | DATA | 201  |     |
| 213 | 214                         | -3.8293198E-01 | -3.858783E-01  | -3.879007E-01  | -3.901978E-01  | DATA | 202  |     |
| 214 | 215                         | -3.9238852E-01 | -3.944115E-01  | -3.963258E-01  | -3.981108E-01  | DATA | 203  |     |
| 215 | 216                         | -3.9976427E-01 | -4.018885E-01  | -4.025764E-01  | -4.039538E-01  | DATA | 204  |     |



|     |                            |                  |                 |                 |                  |          |
|-----|----------------------------|------------------|-----------------|-----------------|------------------|----------|
| 216 | 217                        | -4.0505578E-01   | -4.0504402E-01  | -4.0507225E-01  | -4.050761505E-01 | DATA 205 |
| 217 | 218                        | -4.05081971E-01  | -4.05084308E-01 | -4.05095267E-01 | -4.050912577E-01 | DATA 206 |
| 218 | 219                        | -4.050918209E-01 | -4.05096152E-01 | -4.05082394E-01 | -4.050844953E-01 | DATA 207 |
| 219 | DATA IRSUN (1) = 36173681/ |                  |                 |                 |                  | DATA 208 |
| 220 | 221                        | -4.0797877E-01   | -4.0798925E-01  | -4.080424E-01   | -4.0558276E-01   | DATA 209 |
| 221 | 222                        | -4.0422592E-01   | -4.053362E-01   | -4.0280667E-01  | -4.0505457E-01   | DATA 210 |
| 222 | DATA IRSUN (1) = 17861/    |                  |                 |                 |                  | DATA 210 |
| 223 | 231                        | 9.8389982E-01    | 9.8388139E-01   | 9.8387879E-01   | 9.8386639E-01    | DATA 211 |
| 224 | 232                        | 9.8386820E-01    | 9.8387633E-01   | 9.8389644E-01   | 9.8391082E-01    | DATA 212 |
| 225 | 233                        | 9.8393571E-01    | 9.8396632E-01   | 9.8400195E-01   | 9.8404284E-01    | DATA 213 |
| 226 | 234                        | 9.8408726E-01    | 9.8413649E-01   | 9.8418982E-01   | 9.8424787E-01    | DATA 214 |
| 227 | 235                        | 9.8430884E-01    | 9.8437258E-01   | 9.8440635E-01   | 9.84451285E-01   | DATA 215 |
| 228 | 236                        | 9.8458799E-01    | 9.8466728E-01   | 9.8473065E-01   | 9.8488855E-01    | DATA 216 |
| 229 | 237                        | 9.8493095E-01    | 9.8502858E-01   | 9.8513138E-01   | 9.8528959E-01    | DATA 217 |
| 230 | 238                        | 9.8535380E-01    | 9.8547365E-01   | 9.8559968E-01   | 9.8573187E-01    | DATA 218 |
| 231 | 239                        | 9.8588988E-01    | 9.8601268E-01   | 9.8616172E-01   | 9.8631624E-01    | DATA 219 |
| 232 | DATA IRSUN (1) = 579721/   |                  |                 |                 |                  | DATA 220 |
| 233 | 241                        | 9.8647586E-01    | 9.8644008E-01   | 9.8640897E-01   | 9.8638233E-01    | DATA 221 |
| 234 | 242                        | 9.8713949E-01    | 9.8734049E-01   | 9.8752490E-01   | 9.8771289E-01    | DATA 222 |
| 235 | 243                        | 9.8798289E-01    | 9.8809542E-01   | 9.8829067E-01   | 9.8848827E-01    | DATA 223 |
| 236 | 244                        | 9.8868793E-01    | 9.8888973E-01   | 9.8909389E-01   | 9.8930087E-01    | DATA 224 |
| 237 | 245                        | 9.8938828E-01    | 9.8972298E-01   | 9.8993905E-01   | 9.9015837E-01    | DATA 225 |
| 238 | 246                        | 9.9038190E-01    | 9.9060932E-01   | 9.9084082E-01   | 9.9131684E-01    | DATA 226 |
| 239 | 247                        | 9.9135979E-01    | 9.9180745E-01   | 9.9225898E-01   | 9.9231389E-01    | DATA 227 |
| 240 | 248                        | 9.9257225E-01    | 9.9283369E-01   | 9.9309793E-01   | 9.9336458E-01    | DATA 228 |
| 241 | 249                        | 9.9363870E-01    | 9.9390457E-01   | 9.9417698E-01   | 9.9445086E-01    | DATA 229 |
| 242 | DATA IRSUN (1) = 7392881/  |                  |                 |                 |                  | DATA 230 |
| 243 | 251                        | 9.9472459E-01    | 9.9499938E-01   | 9.9527435E-01   | 9.9554981E-01    | DATA 231 |
| 244 | 252                        | 9.9582244E-01    | 9.9609882E-01   | 9.9637358E-01   | 9.9664859E-01    | DATA 232 |
| 245 | 253                        | 9.9692398E-01    | 9.9728003E-01   | 9.9747692E-01   | 9.9775473E-01    | DATA 233 |
| 246 | 254                        | 9.9803439E-01    | 9.9815368E-01   | 9.9829775E-01   | 9.9888181E-01    | DATA 234 |
| 247 | 255                        | 9.9916755E-01    | 9.9949488E-01   | 9.9974368E-01   | 1.0000339E 00    | DATA 235 |
| 248 | 256                        | 1.0008253E 00    | 1.0006173E 00   | 1.0009109E 00   | 1.0012087E 00    | DATA 236 |
| 249 | 257                        | 1.0014988E 00    | 1.0017928E 00   | 1.0020864E 00   | 1.0023790E 00    | DATA 237 |
| 250 | 258                        | 1.0026705E 00    | 1.0029608E 00   | 1.0032487E 00   | 1.0035346E 00    | DATA 238 |
| 251 | 259                        | 1.0038178E 00    | 1.0040985E 00   | 1.0043767E 00   | 1.0046524E 00    | DATA 239 |
| 252 | DATA IRSUN (1) = 1897144/  |                  |                 |                 |                  | DATA 240 |
| 253 | 261                        | 1.0047257E 00    | 1.0051968E 00   | 1.0054659E 00   | 1.0057334E 00    | DATA 241 |
| 254 | 262                        | 1.0059996E 00    | 1.0062648E 00   | 1.0065284E 00   | 1.0067922E 00    | DATA 242 |
| 255 | 263                        | 1.0070533E 00    | 1.0073148E 00   | 1.0075747E 00   | 1.0078342E 00    | DATA 243 |
| 256 | 264                        | 1.0088927E 00    | 1.0088302E 00   | 1.0086642E 00   | 1.0088613E 00    | DATA 244 |
| 257 | 265                        | 1.0091146E 00    | 1.0093662E 00   | 1.0096153E 00   | 1.0098620E 00    | DATA 245 |
| 258 | 266                        | 1.0101059E 00    | 1.0103468E 00   | 1.0105835E 00   | 1.0108185E 00    | DATA 246 |
| 259 | 267                        | 1.0110449E 00    | 1.0112268E 00   | 1.0114882E 00   | 1.0117029E 00    | DATA 247 |
| 260 | 268                        | 1.0119138E 00    | 1.0121182E 00   | 1.0123198E 00   | 1.0125184E 00    | DATA 248 |
| 261 | 269                        | 1.0127098E 00    | 1.0128993E 00   | 1.0130862E 00   | 1.0132695E 00    | DATA 249 |
| 262 | DATA IRSUN (1) = 14591861/ |                  |                 |                 |                  | DATA 250 |
| 263 | 271                        | 1.0134580E 00    | 1.0136275E 00   | 1.0138028E 00   | 1.0139744E 00    | DATA 251 |
| 264 | 272                        | 1.0141438E 00    | 1.0143103E 00   | 1.0144747E 00   | 1.0146359E 00    | DATA 252 |
| 265 | 273                        | 1.0147943E 00    | 1.0149492E 00   | 1.0151014E 00   | 1.0152476E 00    | DATA 253 |
| 266 | 274                        | 1.0153940E 00    | 1.0155544E 00   | 1.0156959E 00   | 1.0157978E 00    | DATA 254 |
| 267 | 275                        | 1.0159237E 00    | 1.0160439E 00   | 1.0161574E 00   | 1.0162689E 00    | DATA 255 |
| 268 | 276                        | 1.0163681E 00    | 1.0164612E 00   | 1.0165512E 00   | 1.0166351E 00    | DATA 256 |
| 269 | 277                        | 1.0167139E 00    | 1.0167877E 00   | 1.0168564E 00   | 1.0169289E 00    | DATA 257 |
| 270 | 278                        | 1.0169889E 00    | 1.0170688E 00   | 1.0171087E 00   | 1.0171389E 00    | DATA 258 |
| 271 | 279                        | 1.0171844E 00    | 1.0172224E 00   | 1.0172598E 00   | 1.0172988E 00    | DATA 259 |
| 272 | DATA IRSUN (1) = 18172261/ |                  |                 |                 |                  | DATA 260 |
| 273 | 281                        | 1.0173245E 00    | 1.0173515E 00   | 1.0173748E 00   | 1.0173932E 00    | DATA 261 |
| 274 | 282                        | 1.0174096E 00    | 1.0174206E 00   | 1.0174268E 00   | 1.0174279E 00    | DATA 262 |
| 275 | 283                        | 1.0174235E 00    | 1.0174138E 00   | 1.0173973E 00   | 1.0173752E 00    | DATA 263 |
| 276 | 284                        | 1.0173466E 00    | 1.0173317E 00   | 1.0172707E 00   | 1.0172288E 00    | DATA 264 |
| 277 | 285                        | 1.0171730E 00    | 1.0171326E 00   | 1.0170498E 00   | 1.0169883E 00    | DATA 265 |
| 278 | 286                        | 1.0169089E 00    | 1.0168298E 00   | 1.0167468E 00   | 1.0166657E 00    | DATA 266 |
| 279 | 287                        | 1.0165788E 00    | 1.0164773E 00   | 1.0163805E 00   | 1.0162024E 00    | DATA 267 |
| 280 | 288                        | 1.0161722E 00    | 1.0160710E 00   | 1.0159618E 00   | 1.0158489E 00    | DATA 268 |
| 281 | 289                        | 1.0159338E 00    | 1.0158633E 00   | 1.0157490E 00   | 1.0156868E 00    | DATA 269 |
| 282 | DATA IRSUN (1) = 28722521/ |                  |                 |                 |                  | DATA 270 |
| 283 | 291                        | 1.0158386E 00    | 1.01580938E 00  | 1.0157523E 00   | 1.0156891E 00    | DATA 271 |
| 284 | 292                        | 1.0146526E 00    | 1.0144948E 00   | 1.0143318E 00   | 1.0141687E 00    | DATA 272 |
| 285 | 293                        | 1.0139889E 00    | 1.0138810E 00   | 1.0137265E 00   | 1.0135644E 00    | DATA 273 |
| 286 | 294                        | 1.0132482E 00    | 1.0130502E 00   | 1.0128508E 00   | 1.0126412E 00    | DATA 274 |
| 287 | 295                        | 1.0128411E 00    | 1.0126222E 00   | 1.0124020E 00   | 1.01218012E 00   | DATA 275 |
| 288 | 296                        | 1.0115918E 00    | 1.0113745E 00   | 1.0111554E 00   | 1.0109336E 00    | DATA 276 |

|     |     |                          |                |                |                 |          |
|-----|-----|--------------------------|----------------|----------------|-----------------|----------|
| 289 | 297 | 1.0107132E 00.           | 1.0104880E 00. | 1.0102614E 00. | 1.01008329E 00. | DATA 277 |
| 290 | 298 | 1.0098007E 00.           | 1.0095675E 00. | 1.0093304E 00. | 1.0090689E 00.  | DATA 278 |
| 291 | 299 | 1.0088456E 00.           | 1.0085978E 00. | 1.0083464E 00. | 1.0080913E 00.  | DATA 279 |
| 292 |     | DATA (RSUN (I)=255286)/  |                |                |                 | DATA 280 |
| 293 | 301 | 1.0078327E 00.           | 1.0075704E 00. | 1.0073054E 00. | 1.0070371E 00.  | DATA 281 |
| 294 | 302 | 1.0067650E 00.           | 1.0064925E 00. | 1.0062168E 00. | 1.0059372E 00.  | DATA 282 |
| 295 | 303 | 1.0056599E 00.           | 1.0053794E 00. | 1.0050982E 00. | 1.0048141E 00.  | DATA 283 |
| 296 | 304 | 1.0045380E 00.           | 1.0042519E 00. | 1.0039708E 00. | 1.0036846E 00.  | DATA 284 |
| 297 | 305 | 1.0034078E 00.           | 1.0031127E 00. | 1.0028247E 00. | 1.0025367E 00.  | DATA 285 |
| 298 | 306 | 1.0022882E 00.           | 1.0019888E 00. | 1.0016972E 00. | 1.0014042E 00.  | DATA 286 |
| 299 | 307 | 1.0011638E 00.           | 1.0008603E 00. | 1.0005597E 00. | 1.0002598E 00.  | DATA 287 |
| 300 | 308 | 1.0000237E 00.           | 1.9997343E-01. | 1.9994504E-01. | 1.9991543E-01.  | DATA 288 |
| 301 | 309 | 1.9988388E-01.           | 1.9985724E-01. | 1.9983077E-01. | 1.9979892E-01.  | DATA 289 |
| 302 |     | DATA (RSUN (I)=2897324)/ |                |                |                 | DATA 290 |
| 303 | 311 | 1.9977781E-01.           | 1.9974071E-01. | 1.9971175E-01. | 1.9968292E-01.  | DATA 291 |
| 304 | 312 | 1.9965427E-01.           | 1.9961982E-01. | 1.9958762E-01. | 1.9955695E-01.  | DATA 292 |
| 305 | 313 | 1.9952844E-01.           | 1.9949476E-01. | 1.9946177E-01. | 1.9942955E-01.  | DATA 293 |
| 306 | 314 | 1.9939859E-01.           | 1.9936638E-01. | 1.9933442E-01. | 1.9930266E-01.  | DATA 294 |
| 307 | 315 | 1.9926590E-01.           | 1.9923567E-01. | 1.9920412E-01. | 1.9917252E-01.  | DATA 295 |
| 308 | 316 | 1.9913029E-01.           | 1.9909943E-01. | 1.9906870E-01. | 1.9903819E-01.  | DATA 296 |
| 309 | 317 | 1.9899165E-01.           | 1.9896038E-01. | 1.9892937E-01. | 1.9889853E-01.  | DATA 297 |
| 310 | 318 | 1.9884966E-01.           | 1.9881822E-01. | 1.9878719E-01. | 1.9875649E-01.  | DATA 298 |
| 311 | 319 | 1.9870382E-01.           | 1.9867270E-01. | 1.9864183E-01. | 1.9861122E-01.  | DATA 299 |
| 312 |     | DATA (RSUN (I)=3237380)/ |                |                |                 | DATA 300 |
| 313 | 321 | 1.9855126E-01.           | 1.9852037E-01. | 1.9848964E-01. | 1.9845910E-01.  | DATA 301 |
| 314 | 322 | 1.9840443E-01.           | 1.9837437E-01. | 1.9834437E-01. | 1.9831437E-01.  | DATA 302 |
| 315 | 323 | 1.9825778E-01.           | 1.9822841E-01. | 1.9819843E-01. | 1.9816862E-01.  | DATA 303 |
| 316 | 324 | 1.9810754E-01.           | 1.9807861E-01. | 1.9804907E-01. | 1.9801980E-01.  | DATA 304 |
| 317 | 325 | 1.9795774E-01.           | 1.9792914E-01. | 1.9789983E-01. | 1.9787093E-01.  | DATA 305 |
| 318 | 326 | 1.9780394E-01.           | 1.9777508E-01. | 1.9774563E-01. | 1.9771649E-01.  | DATA 306 |
| 319 | 327 | 1.9764997E-01.           | 1.9762045E-01. | 1.9759031E-01. | 1.9756044E-01.  | DATA 307 |
| 320 | 328 | 1.9749237E-01.           | 1.9746212E-01. | 1.9743269E-01. | 1.9740311E-01.  | DATA 308 |
| 321 | 329 | 1.9733626E-01.           | 1.9730607E-01. | 1.9727614E-01. | 1.9724642E-01.  | DATA 309 |
| 322 |     | DATA (RSUN (I)=3617388)/ |                |                |                 | DATA 310 |
| 323 | 331 | 1.9718052E-01.           | 1.9715044E-01. | 1.9712068E-01. | 1.9709126E-01.  | DATA 311 |
| 324 | 332 | 1.9702557E-01.           | 1.9699593E-01. | 1.9696659E-01. | 1.9693753E-01.  | DATA 312 |
| 325 |     | DATA (RAMON(I)=17 46)/   |                |                |                 | DATA 312 |
| 326 | 341 | 1.9686289E 00.           | 1.9683394E 00. | 1.9680534E 00. | 1.9677709E 00.  | DATA 313 |
| 327 | 342 | 1.9670467E 00.           | 1.9667606E 00. | 1.9664782E 00. | 1.9661995E 00.  | DATA 314 |
| 328 | 343 | 1.9654792E 00.           | 1.9651981E 00. | 1.9649209E 00. | 1.9646476E 00.  | DATA 315 |
| 329 | 344 | 1.9639232E 00.           | 1.9636481E 00. | 1.9633762E 00. | 1.9631083E 00.  | DATA 316 |
| 330 | 345 | 1.9623827E 00.           | 1.9621099E 00. | 1.9618404E 00. | 1.9615742E 00.  | DATA 317 |
| 331 | 346 | 1.9608512E 00.           | 1.9605801E 00. | 1.9603123E 00. | 1.9600487E 00.  | DATA 318 |
| 332 | 347 | 1.9593349E-01.           | 1.9590646E-01. | 1.9587972E-01. | 1.9585337E-01.  | DATA 319 |
| 333 | 348 | 1.9578293E-01.           | 1.9575601E-01. | 1.9572942E-01. | 1.9570316E-01.  | DATA 320 |
| 334 | 349 | 1.9563295E-01.           | 1.9560627E-01. | 1.9557993E-01. | 1.9555394E-01.  | DATA 321 |
| 335 |     | DATA (RAMON(I)=377 72)/  |                |                |                 | DATA 322 |
| 336 | 351 | 1.9548465E 00.           | 1.9545800E 00. | 1.9543165E 00. | 1.9540554E 00.  | DATA 323 |
| 337 | 352 | 1.9533800E 00.           | 1.9531165E 00. | 1.9528560E 00. | 1.9525984E 00.  | DATA 324 |
| 338 | 353 | 1.9519245E 00.           | 1.9516645E 00. | 1.9514079E 00. | 1.9511547E 00.  | DATA 325 |
| 339 | 354 | 1.9504790E 00.           | 1.9502242E-01. | 1.9499783E-01. | 1.9495808E-01.  | DATA 326 |
| 340 | 355 | 1.9490343E-01.           | 1.9487802E 00. | 1.9484286E 00. | 1.9480795E 00.  | DATA 327 |
| 341 | 356 | 1.9475900E 00.           | 1.9473361E 00. | 1.9469846E 00. | 1.9466365E 00.  | DATA 328 |
| 342 | 357 | 1.9461467E 00.           | 1.9458948E 00. | 1.9456453E 00. | 1.9453992E 00.  | DATA 329 |
| 343 | 358 | 1.9447046E 00.           | 1.9444547E 00. | 1.9442072E 00. | 1.9439623E 00.  | DATA 330 |
| 344 | 359 | 1.9432637E 00.           | 1.9430158E 00. | 1.9427709E 00. | 1.9425280E 00.  | DATA 331 |
| 345 |     | DATA (RAMON(I)=737188)/  |                |                |                 | DATA 332 |
| 346 | 361 | 1.9418236E 00.           | 1.9415767E 00. | 1.9413328E 00. | 1.9410919E-01.  | DATA 333 |
| 347 | 362 | 1.9403845E-01.           | 1.9401396E-01. | 1.9398967E-01. | 1.9396558E 00.  | DATA 334 |
| 348 | 363 | 1.9389464E 00.           | 1.9387035E 00. | 1.9384626E 00. | 1.9382237E 00.  | DATA 335 |
| 349 | 364 | 1.9375093E 00.           | 1.9372684E 00. | 1.9370295E 00. | 1.9367926E 00.  | DATA 336 |
| 350 | 365 | 1.9360732E 00.           | 1.9358343E 00. | 1.9355974E 00. | 1.9353625E 00.  | DATA 337 |
| 351 | 366 | 1.9346381E 00.           | 1.9344012E 00. | 1.9341663E 00. | 1.9339334E 00.  | DATA 338 |
| 352 | 367 | 1.9332040E 00.           | 1.9329691E 00. | 1.9327362E 00. | 1.9325053E 00.  | DATA 339 |
| 353 | 368 | 1.9317709E 00.           | 1.9315380E 00. | 1.9313071E 00. | 1.9310782E 00.  | DATA 340 |
| 354 | 369 | 1.9303388E-01.           | 1.9301069E-01. | 1.9298770E-01. | 1.9296491E 00.  | DATA 341 |
| 355 |     | DATA (RAMON(I)=1097144)/ |                |                |                 | DATA 342 |
| 356 | 371 | 1.9289067E 00.           | 1.9286748E 00. | 1.9284449E 00. | 1.9282170E 00.  | DATA 343 |
| 357 | 372 | 1.9274746E 00.           | 1.9272447E 00. | 1.9270168E 00. | 1.9267909E 00.  | DATA 344 |
| 358 | 373 | 1.9260425E 00.           | 1.9258146E 00. | 1.9255887E 00. | 1.9253648E 00.  | DATA 345 |
| 359 | 374 | 1.9246104E 00.           | 1.9243845E 00. | 1.9241606E 00. | 1.9239387E 00.  | DATA 346 |
| 360 | 375 | 1.9231783E 00.           | 1.9229544E 00. | 1.9227325E 00. | 1.9225126E 00.  | DATA 347 |
| 361 | 376 | 1.9217462E 00.           | 1.9215243E 00. | 1.9213044E 00. | 1.9210865E 00.  | DATA 348 |



|     |                             |                |                |                |                |      |     |
|-----|-----------------------------|----------------|----------------|----------------|----------------|------|-----|
| 362 | 377                         | 5.8292598E-01  | 5.8368976E-01  | 5.8860374E-01  | 1.3774183E-00  | DATA | 349 |
| 363 | 378                         | 1.8888939E-00  | 5.9288252E-00  | 2.1721207E-00  | 2.4022333E-00  | DATA | 350 |
| 364 | 379                         | 2.8127558E-00  | 8.6443622E-00  | 8.0029823E-00  | 3.8928920E-00  | DATA | 351 |
| 365 | DATA (RAMOBN(I))=1.8592801/ |                |                |                |                | DATA | 352 |
| 366 | 381                         | 3.3838298E-00  | 3.5943935E-00  | 3.7859445E-00  | 3.9983651E-00  | DATA | 353 |
| 367 | 382                         | 4.8225772E-00  | 4.4565441E-00  | 4.6965127E-00  | 4.9268089E-00  | DATA | 354 |
| 368 | 383                         | 5.2576131E-00  | 5.8826775E-00  | 5.6007147E-00  | 5.8151887E-00  | DATA | 355 |
| 369 | 384                         | 6.8298252E-00  | 8.2487708E-00  | 8.9027726E-01  | 4.3876084E-01  | DATA | 356 |
| 370 | 385                         | 6.8848535E-01  | 9.6389188E-01  | 2.2497917E-00  | 1.8385387E-00  | DATA | 357 |
| 371 | 386                         | 1.8169837E-00  | 2.8778532E-00  | 2.3180334E-00  | 2.8396287E-00  | DATA | 358 |
| 372 | 387                         | 2.7465059E-00  | 2.9485682E-00  | 3.1356984E-00  | 3.3274404E-00  | DATA | 359 |
| 373 | 388                         | 3.5228442E-00  | 3.7252735E-00  | 3.9370638E-00  | 4.6590383E-00  | DATA | 360 |
| 374 | 389                         | 4.3908895E-00  | 4.6268124E-00  | 5.8649329E-00  | 5.0999020E-00  | DATA | 361 |
| 375 | DATA (RAMOBN(I))=1.8172281/ |                |                |                |                | DATA | 362 |
| 376 | 391                         | 5.3286613E-00  | 5.5303025E-00  | 5.7650518E-00  | 5.9788185E-00  | DATA | 363 |
| 377 | 392                         | 6.3926580E-00  | 6.2989728E-01  | 3.5932258E-01  | 6.8418630E-01  | DATA | 364 |
| 378 | 393                         | 8.8538297E-01  | 1.1411014E-00  | 1.4239734E-00  | 1.7039520E-00  | DATA | 365 |
| 379 | 394                         | 1.7716043E-00  | 2.2254699E-00  | 2.4530554E-00  | 2.6686926E-00  | DATA | 366 |
| 380 | 395                         | 2.8726170E-00  | 3.8694932E-00  | 3.2637176E-00  | 3.4593626E-00  | DATA | 367 |
| 381 | 396                         | 3.8888974E-00  | 5.8696208E-00  | 4.9881992E-00  | 4.3161972E-00  | DATA | 368 |
| 382 | 397                         | 4.5513659E-00  | 4.7983572E-00  | 5.0283514E-00  | 5.2618248E-00  | DATA | 369 |
| 383 | 398                         | 5.4883994E-00  | 5.7697932E-00  | 5.9265682E-00  | 6.1426088E-00  | DATA | 370 |
| 384 | 399                         | 7.8878384E-02  | 3.8622493E-01  | 3.4584005E-01  | 7.9785486E-01  | DATA | 371 |
| 385 | DATA (RAMOBN(I))=1.2877252/ |                |                |                |                | DATA | 372 |
| 386 | 401                         | 1.8637834E-00  | 2.8380759E-00  | 2.6127470E-00  | 1.8792673E-00  | DATA | 373 |
| 387 | 402                         | 2.8316082E-00  | 2.3696142E-00  | 2.5884588E-00  | 2.7972973E-00  | DATA | 374 |
| 388 | 403                         | 2.9981287E-00  | 3.1980797E-00  | 3.9267512E-00  | 3.5926081E-00  | DATA | 375 |
| 389 | 404                         | 3.7994988E-00  | 4.0186212E-00  | 4.2384624E-00  | 4.4698523E-00  | DATA | 376 |
| 390 | 405                         | 4.7868674E-00  | 4.9484426E-00  | 5.1785109E-00  | 5.4090286E-00  | DATA | 377 |
| 391 | 406                         | 5.8843250E-00  | 5.8583294E-00  | 6.0721716E-00  | 1.3487426E-02  | DATA | 378 |
| 392 | 407                         | 2.8758185E-01  | 4.8776233E-01  | 7.4085453E-01  | 1.8037967E-00  | DATA | 379 |
| 393 | 408                         | 1.2748297E-00  | 1.5461699E-00  | 2.8182039E-00  | 2.8613483E-00  | DATA | 380 |
| 394 | 409                         | 2.2973488E-00  | 2.5190077E-00  | 2.7290524E-00  | 2.9318959E-00  | DATA | 381 |
| 395 | DATA (RAMOBN(I))=1.2537288/ |                |                |                |                | DATA | 382 |
| 396 | 411                         | 3.1289591E-00  | 3.3262928E-00  | 3.5243481E-00  | 3.7317684E-00  | DATA | 383 |
| 397 | 412                         | 3.9443897E-00  | 4.1645563E-00  | 4.3956808E-00  | 4.6235232E-00  | DATA | 384 |
| 398 | 413                         | 4.8971020E-00  | 5.0894768E-00  | 5.3186378E-00  | 5.5448682E-00  | DATA | 385 |
| 399 | 414                         | 5.7688486E-00  | 5.9894242E-00  | 6.2122408E-00  | 1.6495987E-01  | DATA | 386 |
| 400 | 415                         | 6.8847686E-01  | 6.6488897E-01  | 9.3287352E-01  | 1.2089791E-00  | DATA | 387 |
| 401 | 416                         | 1.4842576E-00  | 1.7517565E-00  | 2.0052058E-00  | 2.2428944E-00  | DATA | 388 |
| 402 | 417                         | 2.4643388E-00  | 2.6740158E-00  | 2.8752566E-00  | 3.0728288E-00  | DATA | 389 |
| 403 | 418                         | 3.2888638E-00  | 3.4686352E-00  | 3.6783677E-00  | 3.8809522E-00  | DATA | 390 |
| 404 | 419                         | 4.0988988E-00  | 4.3282829E-00  | 4.5519238E-00  | 4.7818687E-00  | DATA | 391 |
| 405 | DATA (RAMOBN(I))=1.2897324/ |                |                |                |                | DATA | 392 |
| 406 | 421                         | 5.0102735E-00  | 5.2352318E-00  | 5.4563214E-00  | 5.6746873E-00  | DATA | 393 |
| 407 | 422                         | 5.8928688E-00  | 6.1144288E-00  | 6.3428275E-00  | 3.8145283E-01  | DATA | 394 |
| 408 | 423                         | 5.5743895E-01  | 8.2887453E-01  | 1.1179272E-00  | 1.3978765E-00  | DATA | 395 |
| 409 | 424                         | 1.8769372E-00  | 1.9488932E-00  | 2.1850982E-00  | 2.4133185E-00  | DATA | 396 |
| 410 | 425                         | 2.8257650E-00  | 2.8277986E-00  | 3.0239137E-00  | 3.2183172E-00  | DATA | 397 |
| 411 | 426                         | 3.4147035E-00  | 3.6180635E-00  | 3.8244235E-00  | 4.0405205E-00  | DATA | 398 |
| 412 | 427                         | 4.2635404E-00  | 4.4921968E-00  | 4.7280714E-00  | 4.9469485E-00  | DATA | 399 |
| 413 | 428                         | 5.2693920E-00  | 5.3866308E-00  | 5.5993909E-00  | 5.8106425E-00  | DATA | 400 |
| 414 | 429                         | 6.8234586E-00  | 6.2424625E-00  | 3.8936198E-01  | 4.3507081E-01  | DATA | 401 |
| 415 | DATA (RAMOBN(I))=1.3257380/ |                |                |                |                | DATA | 402 |
| 416 | 431                         | 6.9918787E-01  | 9.8862639E-01  | 1.2727837E-00  | 1.5645183E-00  | DATA | 403 |
| 417 | 432                         | 1.8444124E-00  | 2.1852538E-00  | 2.3454027E-00  | 2.5673284E-00  | DATA | 404 |
| 418 | 433                         | 2.7754679E-00  | 2.9748135E-00  | 3.1781352E-00  | 3.3657054E-00  | DATA | 405 |
| 419 | 434                         | 3.5651082E-00  | 3.7710112E-00  | 3.9848309E-00  | 4.2063724E-00  | DATA | 406 |
| 420 | 435                         | 4.3336924E-00  | 4.6634459E-00  | 4.8937964E-00  | 5.1155688E-00  | DATA | 407 |
| 421 | 436                         | 5.3338994E-00  | 5.5445952E-00  | 5.7589261E-00  | 5.9582888E-00  | DATA | 408 |
| 422 | 437                         | 6.2878520E-00  | 6.8225538E-01  | 3.3289107E-01  | 5.8096186E-01  | DATA | 409 |
| 423 | 438                         | 8.4827296E-01  | 1.1384848E-00  | 1.4288556E-00  | 1.7158524E-00  | DATA | 410 |
| 424 | 439                         | 1.9908850E-00  | 2.2471437E-00  | 2.4835279E-00  | 2.7032381E-00  | DATA | 411 |
| 425 | DATA (RAMOBN(I))=1.3817388/ |                |                |                |                | DATA | 412 |
| 426 | 441                         | 2.9109456E-00  | 3.1226258E-00  | 3.3098919E-00  | 3.5097783E-00  | DATA | 413 |
| 427 | 442                         | 3.7145070E-00  | 3.9282257E-00  | 4.1456257E-00  | 4.3716796E-00  | DATA | 414 |
| 428 | DATA (DCMOBN(I))=1.786/     |                |                |                |                | DATA | 414 |
| 429 | 451                         | 4.6463421E-01  | 4.3890006E-01  | 3.8353688E-01  | 3.1808097E-01  | DATA | 415 |
| 430 | 452                         | 2.2517681E-01  | 1.3224109E-01  | 3.6484862E-02  | -5.8719881E-02 | DATA | 416 |
| 431 | 453                         | -1.8043583E-02 | -2.3827875E-02 | -3.1357407E-02 | -3.7840786E-02 | DATA | 417 |
| 432 | 454                         | -4.2835750E-02 | -4.3925743E-02 | -4.6765583E-02 | -4.8126350E-02 | DATA | 418 |
| 433 | 455                         | -4.8972650E-02 | -5.4491098E-02 | -6.0879022E-02 | -1.6171383E-01 | DATA | 419 |
| 434 | 456                         | -5.8877471E-02 | -5.7187102E-02 | -1.6589221E-01 | -2.6576981E-01 | DATA | 420 |



|     |     |                          |               |               |               |      |     |
|-----|-----|--------------------------|---------------|---------------|---------------|------|-----|
| 435 | 437 | 3.514365E-01             | 6.168089E-01  | 5.563277E-01  | 4.679408E-01  | DATA | 421 |
| 436 | 438 | 4.500528E-01             | 4.059715E-01  | 3.408689E-01  | 2.588168E-01  | DATA | 422 |
| 437 | 439 | 1.877899E-01             | 5.198848E-02  | -2.498756E-02 | -1.189076E-02 | DATA | 423 |
| 438 |     | DATA IDCHOON(I)=377 921/ |               |               |               | DATA | 424 |
| 439 | 441 | -2.877184E-01            | -2.881260E-01 | -3.574702E-01 | -4.126813E-01 | DATA | 425 |
| 440 | 442 | -4.803833E-01            | -4.678667E-01 | -6.606791E-01 | -4.292129E-01 | DATA | 426 |
| 441 | 443 | -3.953897E-01            | -2.952563E-01 | -2.999697E-01 | -9.214288E-02 | DATA | 427 |
| 442 | 444 | 2.888843E-02             | 5.348082E-01  | 2.408345E-01  | 3.131916E-01  | DATA | 428 |
| 443 | 445 | 4.881492E-01             | 4.498712E-01  | 5.669829E-01  | 4.562298E-01  | DATA | 429 |
| 444 | 446 | 4.492835E-01             | 5.688333E-01  | 2.841147E-01  | 1.038805E-01  | DATA | 430 |
| 445 | 447 | 7.594368E-02             | -8.752983E-02 | -2.783711E-01 | -2.616200E-01 | DATA | 431 |
| 446 | 448 | -3.846889E-01            | -5.943012E-01 | -4.378841E-01 | -4.615277E-01 | DATA | 432 |
| 447 | 449 | -4.685817E-01            | -6.428820E-01 | -8.978618E-01 | -3.189782E-01 | DATA | 433 |
| 448 |     | DATA IDCHOON(I)=739188/  |               |               |               | DATA | 434 |
| 449 | 471 | -2.828154E-01            | -3.399144E-01 | -2.728374E-02 | 8.881724E-02  | DATA | 435 |
| 450 | 472 | 2.807954E-01             | 5.888307E-01  | 3.812140E-01  | 4.363948E-01  | DATA | 436 |
| 451 | 473 | 4.628853E-01             | 4.588089E-01  | 4.261228E-01  | 3.728445E-01  | DATA | 437 |
| 452 | 474 | 3.817143E-01             | 2.184896E-01  | 2.273877E-01  | 3.341862E-02  | DATA | 438 |
| 453 | 475 | -6.697687E-02            | -2.522307E-01 | -2.872413E-01 | -3.629117E-01 | DATA | 439 |
| 454 | 476 | -3.761113E-01            | -4.237421E-01 | -6.529347E-01 | -4.613686E-01 | DATA | 440 |
| 455 | 477 | -4.478869E-01            | -4.123772E-01 | -3.532967E-01 | -2.762745E-01 | DATA | 441 |
| 456 | 478 | -1.825106E-01            | -7.631388E-02 | 3.704905E-02  | 1.509898E-01  | DATA | 442 |
| 457 | 479 | 2.876827E-01             | 5.485717E-01  | 4.152803E-01  | 4.528300E-01  | DATA | 443 |
| 458 |     | DATA IDCHOON(I)=1899144/ |               |               |               | DATA | 444 |
| 459 | 481 | 4.581977E-01             | 4.536953E-01  | 3.843228E-01  | 3.622279E-01  | DATA | 445 |
| 460 | 482 | 2.352440E-01             | 1.465218E-01  | 3.346482E-02  | -3.987518E-02 | DATA | 446 |
| 461 | 483 | -1.310058E-01            | -2.169123E-01 | -2.948894E-01 | -3.599755E-01 | DATA | 447 |
| 462 | 484 | -4.211438E-01            | -4.484725E-01 | -5.712602E-01 | -4.492190E-01 | DATA | 448 |
| 463 | 485 | -4.288290E-01            | -6.678843E-01 | -2.972939E-01 | -2.615700E-01 | DATA | 449 |
| 464 | 486 | -1.629836E-01            | -5.872514E-01 | 2.058466E-01  | 2.128595E-01  | DATA | 450 |
| 465 | 487 | 3.699872E-01             | 5.878326E-01  | 3.589134E-01  | 4.569577E-01  | DATA | 451 |
| 466 | 488 | 4.528307E-01             | 4.081618E-01  | 3.383927E-01  | 2.589336E-01  | DATA | 452 |
| 467 | 489 | 1.871933E-01             | 7.412128E-02  | -2.969833E-02 | -1.612968E-01 | DATA | 453 |
| 468 |     | DATA IDCHOON(I)=1457180/ |               |               |               | DATA | 454 |
| 469 | 491 | -1.979815E-01            | -2.769467E-01 | -3.458904E-01 | -3.998067E-01 | DATA | 455 |
| 470 | 492 | -4.373891E-01            | -4.558218E-01 | -5.112597E-01 | -4.851808E-01 | DATA | 456 |
| 471 | 493 | -3.782139E-01            | -3.124593E-01 | -2.309318E-01 | -1.370927E-01 | DATA | 457 |
| 472 | 494 | -3.475127E-02            | 7.178426E-02  | 2.730592E-01  | 2.757837E-01  | DATA | 458 |
| 473 | 495 | 3.595352E-01             | 4.286998E-01  | 4.525171E-01  | 4.516299E-01  | DATA | 459 |
| 474 | 496 | 0.294165E-01             | 3.612773E-01  | 2.844511E-01  | 1.959755E-01  | DATA | 460 |
| 475 | 497 | 1.016613E-01             | 5.959831E-03  | -8.772046E-02 | -1.765772E-01 | DATA | 461 |
| 476 | 498 | -2.588118E-01            | -5.298297E-01 | -3.875986E-01 | -4.297098E-01 | DATA | 462 |
| 477 | 499 | -4.521805E-01            | -6.542936E-01 | -8.338692E-01 | -3.907948E-01 | DATA | 463 |
| 478 |     | DATA IDCHOON(I)=1819226/ |               |               |               | DATA | 464 |
| 479 | 501 | -3.833396E-01            | -2.498822E-01 | -5.372550E-01 | -5.693897E-02 | DATA | 465 |
| 480 | 502 | 4.782128E-02             | 3.523598E-01  | 2.503627E-01  | 3.364992E-01  | DATA | 466 |
| 481 | 503 | 4.638899E-01             | 4.452802E-01  | 5.562975E-01  | 4.361525E-01  | DATA | 467 |
| 482 | 504 | 3.877413E-01             | 3.174019E-01  | 2.311035E-01  | 1.369282E-01  | DATA | 468 |
| 483 | 505 | 3.939252E-02             | -5.788068E-02 | -2.495735E-01 | -2.340917E-01 | DATA | 469 |
| 484 | 506 | -3.692157E-01            | -5.718517E-01 | -1.191490E-01 | -4.482382E-01 | DATA | 470 |
| 485 | 507 | -4.588175E-01            | -4.426948E-01 | -8.062706E-01 | -3.487278E-01 | DATA | 471 |
| 486 | 508 | -2.728828E-01            | -2.825067E-01 | -8.213222E-02 | 2.339927E-02  | DATA | 472 |
| 487 | 509 | 1.289268E-01             | 2.289922E-01  | 3.175925E-01  | 3.886568E-01  | DATA | 473 |
| 488 |     | DATA IDCHOON(I)=2877252/ |               |               |               | DATA | 474 |
| 489 | 511 | 4.383825E-01             | 4.582227E-01  | 4.468399E-01  | 4.076567E-01  | DATA | 475 |
| 490 | 512 | 3.853593E-01             | 2.452865E-01  | 2.737718E-01  | 7.657347E-02  | DATA | 476 |
| 491 | 513 | -2.246999E-02            | -1.648899E-01 | -2.849455E-01 | -2.842178E-01 | DATA | 477 |
| 492 | 514 | -3.919133E-01            | -4.842509E-01 | -3.398862E-01 | -4.551148E-01 | DATA | 478 |
| 493 | 515 | -4.492384E-01            | -4.218844E-01 | -3.715981E-01 | -3.814800E-01 | DATA | 479 |
| 494 | 516 | -8.211808E-01            | -2.182181E-01 | -9.185989E-03 | 9.850408E-02  | DATA | 480 |
| 495 | 517 | 2.026877E-01             | 2.958641E-01  | 3.728394E-01  | 4.852988E-01  | DATA | 481 |
| 496 | 518 | 4.521275E-01             | 4.498222E-01  | 4.184707E-01  | 3.639418E-01  | DATA | 482 |
| 497 | 519 | 2.904201E-01             | 2.838141E-01  | 2.092563E-01  | 1.840137E-01  | DATA | 483 |
| 498 |     | DATA IDCHOON(I)=2537288/ |               |               |               | DATA | 484 |
| 499 | 521 | -8.341895E-02            | -2.742964E-01 | -2.568968E-01 | -3.283597E-01 | DATA | 485 |
| 500 | 522 | -3.888826E-01            | -4.268197E-01 | -4.489730E-01 | -4.506232E-01 | DATA | 486 |
| 501 | 523 | -4.508897E-01            | -5.898997E-01 | -2.884934E-01 | -2.499458E-01 | DATA | 487 |
| 502 | 524 | -1.564848E-01            | -5.242803E-02 | 5.675786E-02  | 1.648844E-01  | DATA | 488 |
| 503 | 525 | 2.646862E-01             | 5.498595E-01  | 3.101784E-01  | 4.446158E-01  | DATA | 489 |
| 504 | 526 | 4.486817E-01             | 4.248652E-01  | 3.747815E-01  | 3.862312E-01  | DATA | 490 |
| 505 | 527 | 2.240234E-01             | 3.538887E-01  | 3.559909E-02  | -5.614798E-02 | DATA | 491 |
| 506 | 528 | -4.473683E-01            | -2.317351E-01 | -8.068294E-01 | -3.674308E-01 | DATA | 492 |
| 507 | 529 | -4.129889E-01            | -4.484849E-01 | -4.488383E-01 | -4.350608E-01 | DATA | 493 |

|     |                             |               |               |               |          |   |
|-----|-----------------------------|---------------|---------------|---------------|----------|---|
| 508 | DATA (DCMOON(I):I=2897324)/ |               |               |               | DATA 894 | 0 |
| 509 | 531 -4.816553E-01           | -8.488668E-01 | -2.784902E-01 | -1.929688E-01 | DATA 895 |   |
| 510 | 532 -9.844222E-02           | 6.884541E-02  | 2.182358E-01  | 2.225978E-01  | DATA 896 |   |
| 511 | 533 3.250807E-01            | 8.875162E-01  | 8.328988E-01  | 4.465457E-01  | DATA 897 |   |
| 512 | 534 4.892851E-01            | 5.849057E-01  | 5.195951E-01  | 2.397258E-01  | DATA 898 |   |
| 513 | 535 1.509225E-01            | 5.782345E-02  | -3.573595E-02 | -1.865697E-01 | DATA 899 |   |
| 514 | 536 -2.114828E-01           | -8.876845E-01 | -3.518402E-01 | -4.807129E-01 | DATA 900 |   |
| 515 | 537 -4.324111E-01           | -6.649289E-01 | -3.362492E-01 | -4.886698E-01 | DATA 901 |   |
| 516 | 538 -8.816852E-01           | -8.979152E-01 | -2.193360E-01 | -1.886696E-01 | DATA 902 |   |
| 517 | 539 -2.948883E-01           | 9.449486E-02  | 1.785104E-01  | 2.747872E-01  | DATA 903 |   |
| 518 | DATA (DCMOON(I):I=3257368)/ |               |               |               | DATA 904 | 0 |
| 519 | 541 3.564478E-01            | 4.145942E-01  | 6.425739E-01  | 4.369719E-01  | DATA 905 |   |
| 520 | 542 4.806461E-01            | 5.394805E-01  | 2.689449E-01  | 1.719608E-01  | DATA 906 |   |
| 521 | 543 7.811877E-02            | -6.632215E-02 | -2.974690E-01 | -1.939484E-01 | DATA 907 |   |
| 522 | 544 -2.715258E-01           | -5.379288E-01 | -9.903048E-01 | -4.825960E-01 | DATA 908 |   |
| 523 | 545 -4.426743E-01           | -4.392472E-01 | -1.152912E-01 | -3.722392E-01 | DATA 909 |   |
| 524 | 546 -3.220777E-01           | -2.374689E-01 | -2.513528E-01 | -5.685837E-02 | DATA 910 |   |
| 525 | 547 4.260796E-02            | 6.429781E-01  | 2.391715E-01  | 3.847589E-01  | DATA 911 |   |
| 526 | 548 3.921116E-01            | 6.535055E-01  | 4.432984E-01  | 4.882807E-01  | DATA 912 |   |
| 527 | 549 3.874972E-01            | 8.934372E-01  | 2.042599E-01  | 1.889183E-01  | DATA 913 |   |
| 528 | DATA (DCMOON(I):I=3619368)/ |               |               |               | DATA 914 | 0 |
| 529 | 551 1.147827E-02            | -8.342052E-02 | -2.725443E-01 | -2.532027E-01 | DATA 915 |   |
| 530 | 552 -3.228644E-01           | -8.789850E-01 | -3.199302E-01 | -4.407142E-01 | DATA 916 |   |
| 531 | DATA (DCMOON(I):I=1736)/    |               |               |               | DATA 916 | 0 |
| 532 | 561 5.825954E-01            | 5.888127E-01  | 5.947410E-01  | 6.923159E-01  | DATA 917 |   |
| 533 | 562 6.201632E-01            | 6.178693E-01  | 6.242498E-01  | 6.894867E-01  | DATA 918 |   |
| 534 | 563 6.327685E-01            | 6.341154E-01  | 6.333988E-01  | 6.307808E-01  | DATA 919 |   |
| 535 | 564 6.263880E-01            | 6.285738E-01  | 6.139959E-01  | 6.070888E-01  | DATA 920 |   |
| 536 | 565 6.803645E-01            | 5.942729E-01  | 5.894808E-01  | 5.851815E-01  | DATA 921 |   |
| 537 | 566 5.824194E-01            | 5.889915E-01  | 5.805386E-01  | 5.803707E-01  | DATA 922 |   |
| 538 | 567 5.813152E-01            | 5.829447E-01  | 5.852773E-01  | 5.883712E-01  | DATA 923 |   |
| 539 | 568 5.922812E-01            | 5.978181E-01  | 6.024775E-01  | 6.084738E-01  | DATA 924 |   |
| 540 | 569 6.124588E-01            | 6.289206E-01  | 6.265222E-01  | 6.304437E-01  | DATA 925 |   |
| 541 | DATA (DCMOON(I):I=37792)/   |               |               |               | DATA 926 | 0 |
| 542 | 571 6.832819E-01            | 6.543216E-01  | 6.333695E-01  | 6.203788E-01  | DATA 927 |   |
| 543 | 572 6.254650E-01            | 6.189100E-01  | 6.115329E-01  | 6.027632E-01  | DATA 928 |   |
| 544 | 573 5.943950E-01            | 5.869198E-01  | 5.803455E-01  | 5.757832E-01  | DATA 929 |   |
| 545 | 574 5.931348E-01            | 5.725686E-01  | 5.738386E-01  | 5.766128E-01  | DATA 930 |   |
| 546 | 575 5.804892E-01            | 5.858899E-01  | 5.908919E-01  | 5.952928E-01  | DATA 931 |   |
| 547 | 576 6.805843E-01            | 6.838445E-01  | 6.118945E-01  | 6.212327E-01  | DATA 932 |   |
| 548 | 577 6.258488E-01            | 6.298722E-01  | 6.338199E-01  | 6.349869E-01  | DATA 933 |   |
| 549 | 578 6.554804E-01            | 6.542617E-01  | 6.315815E-01  | 6.262138E-01  | DATA 934 |   |
| 550 | 579 6.194832E-01            | 6.212875E-01  | 6.028981E-01  | 5.925452E-01  | DATA 935 |   |
| 551 | DATA (DCMOON(I):I=937988)/  |               |               |               | DATA 936 | 0 |
| 552 | 581 5.833735E-01            | 5.755866E-01  | 5.694440E-01  | 5.655463E-01  | DATA 937 |   |
| 553 | 582 5.845419E-01            | 5.861858E-01  | 5.705470E-01  | 5.758937E-01  | DATA 938 |   |
| 554 | 583 5.828839E-01            | 5.982766E-01  | 5.978082E-01  | 6.850058E-01  | DATA 939 |   |
| 555 | 584 6.116445E-01            | 6.175910E-01  | 6.228947E-01  | 6.872425E-01  | DATA 940 |   |
| 556 | 585 6.309218E-01            | 6.339891E-01  | 6.853594E-01  | 6.366996E-01  | DATA 941 |   |
| 557 | 586 6.364438E-01            | 6.348172E-01  | 6.316880E-01  | 6.186983E-01  | DATA 942 |   |
| 558 | 587 6.285297E-01            | 6.128837E-01  | 6.038740E-01  | 5.939739E-01  | DATA 943 |   |
| 559 | 588 5.842328E-01            | 5.732226E-01  | 5.678610E-01  | 5.625918E-01  | DATA 944 |   |
| 560 | 589 5.682513E-01            | 5.689649E-01  | 5.645999E-01  | 5.706948E-01  | DATA 945 |   |
| 561 | DATA (DCMOON(I):I=1899144)/ |               |               |               | DATA 946 | 0 |
| 562 | 591 5.985791E-01            | 5.874875E-01  | 5.968863E-01  | 6.055578E-01  | DATA 947 |   |
| 563 | 592 6.236387E-01            | 6.286347E-01  | 6.263940E-01  | 6.308788E-01  | DATA 948 |   |
| 564 | 593 6.341224E-01            | 6.361970E-01  | 6.373709E-01  | 6.370878E-01  | DATA 949 |   |
| 565 | 594 6.359328E-01            | 6.389386E-01  | 6.303711E-01  | 6.185884E-01  | DATA 950 |   |
| 566 | 595 6.200848E-01            | 6.138129E-01  | 6.049798E-01  | 5.961977E-01  | DATA 951 |   |
| 567 | 596 5.871205E-01            | 5.783568E-01  | 5.705279E-01  | 5.646842E-01  | DATA 952 |   |
| 568 | 597 5.611878E-01            | 5.605826E-01  | 5.629957E-01  | 5.682882E-01  | DATA 953 |   |
| 569 | 598 5.756892E-01            | 5.846848E-01  | 5.943771E-01  | 6.040447E-01  | DATA 954 |   |
| 570 | 599 6.230225E-01            | 6.288315E-01  | 6.273665E-01  | 6.318838E-01  | DATA 955 |   |
| 571 | DATA (DCMOON(I):I=1457180)/ |               |               |               | DATA 956 | 0 |
| 572 | 881 6.249708E-01            | 6.385152E-01  | 6.366733E-01  | 6.355989E-01  | DATA 957 |   |
| 573 | 882 6.334780E-01            | 6.384418E-01  | 6.265865E-01  | 6.181968E-01  | DATA 958 |   |
| 574 | 883 6.266178E-01            | 6.185856E-01  | 6.038804E-01  | 5.967848E-01  | DATA 959 |   |
| 575 | 884 5.892885E-01            | 5.828105E-01  | 5.753715E-01  | 5.699542E-01  | DATA 960 |   |
| 576 | 885 5.863879E-01            | 5.858459E-01  | 5.663392E-01  | 5.702408E-01  | DATA 961 |   |
| 577 | 886 5.984833E-01            | 5.846699E-01  | 5.935303E-01  | 6.029515E-01  | DATA 962 |   |
| 578 | 887 6.119846E-01            | 6.199532E-01  | 6.264980E-01  | 6.313858E-01  | DATA 963 |   |
| 579 | 888 6.342549E-01            | 6.338710E-01  | 6.342937E-01  | 6.327658E-01  | DATA 964 |   |
| 580 | 889 6.295488E-01            | 6.254407E-01  | 6.207148E-01  | 6.155989E-01  | DATA 965 |   |



|     |                            |             |     |            |     |            |     |             |     |          |          |
|-----|----------------------------|-------------|-----|------------|-----|------------|-----|-------------|-----|----------|----------|
| 581 | DATA (RM00N (I))=1817226)/ |             |     |            |     |            |     |             |     |          | DATA 566 |
| 582 | 011                        | 6,1026683E  | 01, | 6,8483878E | 01, | 5,9937758E | 01, | 5,9396585E  | 01, | DATA 567 |          |
| 583 | 012                        | 5,8869082E  | 01, | 6,8898888E | 01, | 5,7923008E | 01, | 5,2563798E  | 01, | DATA 568 |          |
| 584 | 013                        | 5,7324196E  | 01, | 5,7242918E | 01, | 5,7348679E | 01, | 5,7654650E  | 01, | DATA 569 |          |
| 585 | 014                        | 5,8133239E  | 01, | 5,8844911E | 01, | 5,9591875E | 01, | 6,0422051E  | 01, | DATA 570 |          |
| 586 | 015                        | 6,1244196E  | 01, | 6,1989239E | 01, | 6,2611104E | 01, | 6,3067855E  | 01, | DATA 571 |          |
| 587 | 016                        | 6,1835306E  | 01, | 6,3483868E | 01, | 6,3280915E | 01, | 6,12988284E | 01, | DATA 572 |          |
| 588 | 017                        | 6,2538776E  | 01, | 6,2813368E | 01, | 6,1416377E | 01, | 6,0801629E  | 01, | DATA 573 |          |
| 589 | 018                        | 6,0206087E  | 01, | 5,9695575E | 01, | 5,9127838E | 01, | 5,8774581E  | 01, | DATA 574 |          |
| 590 | 019                        | 5,8449089E  | 01, | 5,8199982E | 01, | 5,8026059E | 01, | 5,7929687E  | 01, | DATA 575 |          |
| 591 | DATA (RM00N (I))=2677252)/ |             |     |            |     |            |     |             |     |          | DATA 576 |
| 592 | 021                        | 5,7918751E  | 01, | 5,8883838E | 01, | 5,8283979E | 01, | 5,8523786E  | 01, | DATA 577 |          |
| 593 | 022                        | 5,9868351E  | 01, | 5,9520438E | 01, | 6,0160814E | 01, | 6,08849528E | 01, | DATA 578 |          |
| 594 | 023                        | 6,1339527E  | 01, | 6,2197708E | 01, | 6,2780814E | 01, | 6,3117899E  | 01, | DATA 579 |          |
| 595 | 024                        | 6,1839283E  | 01, | 6,3384807E | 01, | 6,3187792E | 01, | 6,2828024E  | 01, | DATA 580 |          |
| 596 | 025                        | 6,12288437E | 01, | 6,1626113E | 01, | 6,0888849E | 01, | 6,0138881E  | 01, | DATA 581 |          |
| 597 | 026                        | 5,9409214E  | 01, | 5,8795438E | 01, | 5,8289442E | 01, | 5,7915213E  | 01, | DATA 582 |          |
| 598 | 027                        | 5,7919281E  | 01, | 5,7672655E | 01, | 5,7755598E | 01, | 5,7943880E  | 01, | DATA 583 |          |
| 599 | 028                        | 5,8214373E  | 01, | 5,8549542E | 01, | 5,8932318E | 01, | 5,9373112E  | 01, | DATA 584 |          |
| 600 | 029                        | 5,9856984E  | 01, | 6,0379149E | 01, | 6,0951967E | 01, | 6,1498283E  | 01, | DATA 585 |          |
| 601 | DATA (RM00N (I))=2537288)/ |             |     |            |     |            |     |             |     |          | DATA 586 |
| 602 | 031                        | 6,12052737E | 01, | 6,2583150E | 01, | 6,2993014E | 01, | 6,3305241E  | 01, | DATA 587 |          |
| 603 | 032                        | 6,13468132E | 01, | 6,3449242E | 01, | 6,3238795E | 01, | 6,2832542E  | 01, | DATA 588 |          |
| 604 | 033                        | 6,2243660E  | 01, | 6,1381755E | 01, | 6,0652779E | 01, | 5,9756355E  | 01, | DATA 589 |          |
| 605 | 034                        | 5,8881513E  | 01, | 5,8899618E | 01, | 5,7415898E | 01, | 5,72037784E | 01, | DATA 590 |          |
| 606 | 035                        | 5,8872077E  | 01, | 5,6927725E | 01, | 5,7189889E | 01, | 5,7586813E  | 01, | DATA 591 |          |
| 607 | 036                        | 5,8119486E  | 01, | 5,8729552E | 01, | 5,9347118E | 01, | 5,9972782E  | 01, | DATA 592 |          |
| 608 | 037                        | 6,0977921E  | 01, | 6,1152902E | 01, | 6,1691038E | 01, | 6,2188785E  | 01, | DATA 593 |          |
| 609 | 038                        | 6,2638433E  | 01, | 6,3828032E | 01, | 6,3380135E | 01, | 6,3552782E  | 01, | DATA 594 |          |
| 610 | 039                        | 6,1841467E  | 01, | 6,3582282E | 01, | 6,3355686E | 01, | 6,2949969E  | 01, | DATA 595 |          |
| 611 | DATA (RM00N (I))=2899324)/ |             |     |            |     |            |     |             |     |          | DATA 596 |
| 612 | 041                        | 6,2584885E  | 01, | 6,1615248E | 01, | 6,0732792E | 01, | 5,9767071E  | 01, | DATA 597 |          |
| 613 | 042                        | 5,8784012E  | 01, | 5,7861288E | 01, | 5,7080118E | 01, | 5,6514059E  | 01, | DATA 598 |          |
| 614 | 043                        | 5,8216629E  | 01, | 5,6221883E | 01, | 5,6487832E | 01, | 5,7004886E  | 01, | DATA 599 |          |
| 615 | 044                        | 5,7708457E  | 01, | 5,8384143E | 01, | 5,9348488E | 01, | 6,0177095E  | 01, | DATA 600 |          |
| 616 | 045                        | 6,0948580E  | 01, | 6,1636902E | 01, | 6,2229105E | 01, | 6,2721598E  | 01, | DATA 601 |          |
| 617 | 046                        | 6,13116021E | 01, | 6,3445337E | 01, | 6,3620599E | 01, | 6,3728821E  | 01, | DATA 602 |          |
| 618 | 047                        | 6,1732339E  | 01, | 6,3629592E | 01, | 6,3314920E | 01, | 6,18991797E | 01, | DATA 603 |          |
| 619 | 048                        | 6,1458834E  | 01, | 6,1792923E | 01, | 6,0955158E | 01, | 6,0633986E  | 01, | DATA 604 |          |
| 620 | 049                        | 5,9058039E  | 01, | 5,8893055E | 01, | 5,7287925E | 01, | 5,6513997E  | 01, | DATA 605 |          |
| 621 | DATA (RM00N (I))=3257368)/ |             |     |            |     |            |     |             |     |          | DATA 606 |
| 622 | 051                        | 5,6056632E  | 01, | 5,5897392E | 01, | 5,6054968E | 01, | 5,5510480E  | 01, | DATA 607 |          |
| 623 | 052                        | 5,7211698E  | 01, | 5,8884327E | 01, | 5,9085828E | 01, | 6,0017980E  | 01, | DATA 608 |          |
| 624 | 053                        | 6,0939545E  | 01, | 6,1758492E | 01, | 6,2432771E | 01, | 6,2968472E  | 01, | DATA 609 |          |
| 625 | 054                        | 6,3856519E  | 01, | 6,3884692E | 01, | 6,3725498E | 01, | 6,3732326E  | 01, | DATA 610 |          |
| 626 | 055                        | 6,1636325E  | 01, | 6,3444893E | 01, | 6,3158462E | 01, | 6,2776246E  | 01, | DATA 611 |          |
| 627 | 056                        | 6,1293457E  | 01, | 6,1787239E | 01, | 6,1641245E | 01, | 6,0244886E  | 01, | DATA 612 |          |
| 628 | 057                        | 5,9406998E  | 01, | 5,8548398E | 01, | 5,7726456E | 01, | 5,7010252E  | 01, | DATA 613 |          |
| 629 | 058                        | 5,6472414E  | 01, | 5,6197362E | 01, | 5,6168394E | 01, | 5,6457486E  | 01, | DATA 614 |          |
| 630 | 059                        | 5,7021377E  | 01, | 5,7885801E | 01, | 5,8735591E | 01, | 5,9727682E  | 01, | DATA 615 |          |
| 631 | DATA (RM00N (I))=3617368)/ |             |     |            |     |            |     |             |     |          | DATA 616 |
| 632 | 061                        | 6,0702812E  | 01, | 6,1593918E | 01, | 6,2320778E | 01, | 6,2941564E  | 01, | DATA 617 |          |
| 633 | 062                        | 6,1335198E  | 01, | 6,3582675E | 01, | 6,3646485E | 01, | 6,3564017E  | 01, | DATA 618 |          |
| 634 | END                        |             |     |            |     |            |     |             |     |          | DATA 619 |

29746 WORDS OF MEMORY USED BY THIS COMPILATION

67906 05 09-25-72 18,584 1972 EPMEMENTS

## PREFACE

PROGRAM BREAK 4273

COMMON LENGTH

|   |       |     |   |
|---|-------|-----|---|
| Y | COUNT | RIS | 5 |
|---|-------|-----|---|

PRIMARY SYMDEF ENTRY

TABLE 1

~~SECONDARY SYNDROME ENTRY~~

| BLOCK    | LENGTH |
|----------|--------|
| 1 ERWDLK | 12     |

SYNREF

4273 TO THE NEXT AVAILABLE LOCATION.  
 GHAP VERSION/ASSEMBLY DATES JHPA 050171/052571 JHBB 050171/052571 JHPC 050171/052571  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
 \*\* 19198 WORDS OF MEMORY WERE USED BY GHAP FOR THIS ASSEMBLY.

SNUMB = 71034, ACTIVITY # = 02, REPORT CODE = 74, RECORD COUNT = 05304

71034 02 11-03-72 11.623 1973 EPHEMERIS

|    |                                                                       |                                                             |      |    |
|----|-----------------------------------------------------------------------|-------------------------------------------------------------|------|----|
| 1  | C=1973*                                                               | 1973 EPHEMERIS                                              | DATA | 1  |
| 2  | SUBROUTINE TABLE                                                      |                                                             | DATA | 2  |
| 3  | DIMENSION RASUN (369), DCSUN (369), RSUN (369)                        |                                                             | DATA | 3  |
| 4  | DIMENSION RAMOON (369), DCMOON (369), RMOON (369)                     |                                                             | DATA | 4  |
| 5  | DIMENSION ARRAY (2214)                                                |                                                             |      |    |
| 6  | DOUBLE PRECISION Y                                                    |                                                             |      |    |
| 7  | EQUIVALENCE (RASUN, ARRAY), (DCSUN, ARRAY (370)), (RSUN, ARRAY (739)) |                                                             |      |    |
| 8  | EQUIVALENCE (RAMOON, ARRAY (1108)), (DCMOON, ARRAY (1477))            |                                                             |      |    |
| 9  | EQUIVALENCE (RMOON, ARRAY (1846))                                     |                                                             |      |    |
| 10 | COMMON /EPHBLK/ Y(4), I                                               |                                                             |      |    |
| 11 | Y(1) = ARRAY(I)                                                       |                                                             |      |    |
| 12 | Y(2) = ARRAY(I+1)                                                     |                                                             |      |    |
| 13 | Y(3) = ARRAY(I+2)                                                     |                                                             |      |    |
| 14 | Y(4) = ARRAY(I+3)                                                     |                                                             |      |    |
| 15 | RETURN                                                                |                                                             |      |    |
| 16 | DATA (RASUN (I), I = 1, 36) /                                         |                                                             | DATA | 6  |
| 17 | 11                                                                    | 4.8912026E 00, 4.9104916E 00, 4.9297592E 00, 4.9490029E 00, | DATA | 7  |
| 18 | 12                                                                    | 4.9682201E 00, 4.9874083E 00, 5.0065652E 00, 5.0256882E 00, | DATA | 8  |
| 19 | 13                                                                    | 5.0447753E 00, 5.0638242E 00, 5.0828328E 00, 5.1017992E 00, | DATA | 9  |
| 20 | 14                                                                    | 5.1207219E 00, 5.1395992E 00, 5.1584297E 00, 5.1772118E 00, | DATA | 10 |
| 21 | 15                                                                    | 5.1959443E 00, 5.2146263E 00, 5.2332956E 00, 5.2518343E 00, | DATA | 11 |
| 22 | 16                                                                    | 5.2703585E 00, 5.2888286E 00, 5.3072441E 00, 5.3256047E 00, | DATA | 12 |
| 23 | 17                                                                    | 5.3439099E 00, 5.3621591E 00, 5.3803518E 00, 5.3984877E 00, | DATA | 13 |
| 24 | 18                                                                    | 5.4165664E 00, 5.4345874E 00, 5.4525502E 00, 5.4704547E 00, | DATA | 14 |
| 25 | 19                                                                    | 5.4883003E 00, 5.5060869E 00, 5.5238141E 00, 5.5414819E 00, | DATA | 15 |
| 26 | DATA (RASUN (I), I = 37, 72) /                                        |                                                             | DATA | 16 |
| 27 | 21                                                                    | 5.5590901E 00, 5.5766387E 00, 5.5941279E 00, 5.6115579E 00, | DATA | 17 |
| 28 | 22                                                                    | 5.6289291E 00, 5.6462420E 00, 5.6634971E 00, 5.6806948E 00, | DATA | 18 |
| 29 | 23                                                                    | 5.6978359E 00, 5.7149212E 00, 5.7319515E 00, 5.7489278E 00, | DATA | 19 |
| 30 | 24                                                                    | 5.7658511E 00, 5.7827229E 00, 5.7995443E 00, 5.8163171E 00, | DATA | 20 |
| 31 | 25                                                                    | 5.8330423E 00, 5.8497217E 00, 5.8663552E 00, 5.8829457E 00, | DATA | 21 |
| 32 | 26                                                                    | 5.8994937E 00, 5.9160000E 00, 5.9324673E 00, 5.9488952E 00, | DATA | 22 |
| 33 | 27                                                                    | 5.9652852E 00, 5.9816387E 00, 5.9979566E 00, 6.0142401E 00, | DATA | 23 |
| 34 | 28                                                                    | 6.0304904E 00, 6.0467086E 00, 6.0628939E 00, 6.0790535E 00, | DATA | 24 |
| 35 | 29                                                                    | 6.0951828E 00, 6.1112849E 00, 6.1273612E 00, 6.1434126E 00, | DATA | 25 |
| 36 | DATA (RASUN (I), I = 73, 108) /                                       |                                                             | DATA | 26 |
| 37 | 31                                                                    | 6.1594407E 00, 6.1754469E 00, 6.1914327E 00, 6.2073994E 00, | DATA | 27 |
| 38 | 32                                                                    | 6.2233493E 00, 6.2392831E 00, 6.2552046E 00, 6.2711139E 00, | DATA | 28 |
| 39 | 33                                                                    | 3.8281628E-03, 1.9719598E-02, 3.9604665E-02, 5.1485086E-02, | DATA | 29 |
| 40 | 34                                                                    | 6.7362388E-02, 8.3239099E-02, 9.9113703E-02, 1.1499068E-01, | DATA | 30 |
| 41 | 35                                                                    | 1.3087038E-01, 1.4675415E-01, 1.6264334E-01, 1.7853939E-01, | DATA | 31 |
| 42 | 36                                                                    | 1.9444341E-01, 2.1035663E-01, 2.2628025E-01, 2.4221550E-01, | DATA | 32 |
| 43 | 37                                                                    | 2.5816343E-01, 2.7412503E-01, 2.9010131E-01, 3.0609298E-01, | DATA | 33 |
| 44 | 38                                                                    | 3.2210129E-01, 3.3812736E-01, 3.5417237E-01, 3.7023747E-01, | DATA | 34 |
| 45 | 39                                                                    | 3.6632411E-01, 4.0243394E-01, 4.3856823E-01, 4.7472830E-01, | DATA | 35 |
| 46 | DATA (RASUN (I), I = 109, 144) /                                      |                                                             | DATA | 36 |
| 47 | 41                                                                    | 4.5091609E-01, 4.6713231E-01, 4.8337840E-01, 4.9965563E-01, | DATA | 37 |
| 48 | 42                                                                    | 5.1596504E-01, 5.3230765E-01, 5.4868449E-01, 5.6509647E-01, | DATA | 38 |
| 49 | 43                                                                    | 5.8154441E-01, 5.9802912E-01, 6.1455133E-01, 6.3111188E-01, | DATA | 39 |
| 50 | 44                                                                    | 6.4771122E-01, 6.6434985E-01, 6.8102819E-01, 6.9774667E-01, | DATA | 40 |
| 51 | 45                                                                    | 7.1450529E-01, 7.3130401E-01, 7.4814273E-01, 7.6502106E-01, | DATA | 41 |
| 52 | 46                                                                    | 7.8193916E-01, 7.9889702E-01, 8.1589472E-01, 8.3293221E-01, | DATA | 42 |
| 53 | 47                                                                    | 8.5000993E-01, 8.6712808E-01, 8.8428690E-01, 9.0148654E-01, | DATA | 43 |
| 54 | 48                                                                    | 9.182709E-01, 9.3600851E-01, 9.5333078E-01, 9.7069376E-01,  | DATA | 44 |
| 55 | 49                                                                    | 9.8809721E-01, 1.0055409E 00, 1.0230243E 00, 1.0405471E 00, | DATA | 45 |
| 56 | DATA (RASUN (I), I = 145, 180) /                                      |                                                             | DATA | 46 |
| 57 | 51                                                                    | 1.0581087E 00, 1.1757087E 00, 1.0933442E 00, 1.1110208E 00, | DATA | 47 |
| 58 | 52                                                                    | 1.1287314E 00, 1.1464773E 00, 1.1642571E 00, 1.1820701E 00, | DATA | 48 |
| 59 | 53                                                                    | 1.1999144E 00, 1.2177883E 00, 1.2356902E 00, 1.2536181E 00, | DATA | 49 |
| 60 | 54                                                                    | 1.2715704E 00, 1.2895453E 00, 1.3075419E 00, 1.3255579E 00, | DATA | 50 |
| 61 | 55                                                                    | 1.3435925E 00, 1.3616442E 00, 1.3797118E 00, 1.3977939E 00, | DATA | 51 |
| 62 | 56                                                                    | 1.4158892E 00, 1.4339962E 00, 1.4521135E 00, 1.4702395E 00, | DATA | 52 |
| 63 | 57                                                                    | 1.4883729E 00, 1.5065122E 00, 1.5246537E 00, 1.5428021E 00, | DATA | 53 |
| 64 | 58                                                                    | 1.5609497E 00, 1.5790971E 00, 1.5972427E 00, 1.6153851E 00, | DATA | 54 |
| 65 | 59                                                                    | 1.6335227E 00, 1.6516539E 00, 1.6697769E 00, 1.6878901E 00, | DATA | 55 |
| 66 | DATA (RASUN (I), I = 181, 216) /                                      |                                                             | DATA | 56 |
| 67 | 61                                                                    | 1.7059914E 00, 1.7240784E 00, 1.7421492E 00, 1.7602014E 00, | DATA | 57 |
| 68 | 62                                                                    | 1.7782332E 00, 1.7962427E 00, 1.8142282E 00, 1.8321879E 00, | DATA | 58 |
| 69 | 63                                                                    | 1.8501208E 00, 1.8680294E 00, 1.8859007E 00, 1.9037454E 00, | DATA | 59 |



|     |                               |                 |                 |                 |                 |          |
|-----|-------------------------------|-----------------|-----------------|-----------------|-----------------|----------|
| 70  | 64                            | 1.9215584E 00,  | 1.9393387E 00,  | 1.9570831E 00,  | 1.9747969E 00,  | DATA 60  |
| 71  | 65                            | 1.9924731E 00,  | 2.0101130E 00,  | 2.0277158E 00,  | 2.0452809E 00,  | DATA 61  |
| 72  | 66                            | 2.0628076E 00,  | 2.0802936E 00,  | 2.0977443E 00,  | 2.1151935E 00,  | DATA 62  |
| 73  | 67                            | 2.1325227E 00,  | 2.1498516E 00,  | 2.1671327E 00,  | 2.1843868E 00,  | DATA 63  |
| 74  | 68                            | 2.2015920E 00,  | 2.2187546E 00,  | 2.2358739E 00,  | 2.2529493E 00,  | DATA 64  |
| 75  | 69                            | 2.2699803E 00,  | 2.2869666E 00,  | 2.3039078E 00,  | 2.3208036E 00,  | DATA 65  |
| 76  | DATA (RASUN 1), I=217, 252, / |                 |                 |                 |                 | DATA 66  |
| 77  | 71                            | 2.3376544E 00,  | 2.3544603E 00,  | 2.3712213E 00,  | 2.3879381E 00,  | DATA 67  |
| 78  | 72                            | 2.4046106E 00,  | 2.4212394E 00,  | 2.4378245E 00,  | 2.4543675E 00,  | DATA 68  |
| 79  | 73                            | 2.4208681E 00,  | 2.4373273E 00,  | 2.4537459E 00,  | 2.4701246E 00,  | DATA 69  |
| 80  | 74                            | 2.5364646E 00,  | 2.5527667E 00,  | 2.5690322E 00,  | 2.5852620E 00,  | DATA 70  |
| 81  | 75                            | 2.6014574E 00,  | 2.6176194E 00,  | 2.6337439E 00,  | 2.6498470E 00,  | DATA 71  |
| 82  | 76                            | 2.6659144E 00,  | 2.6819517E 00,  | 2.6979597E 00,  | 2.7139392E 00,  | DATA 72  |
| 83  | 77                            | 2.7298909E 00,  | 2.7458136E 00,  | 2.7617144E 00,  | 2.7775880E 00,  | DATA 73  |
| 84  | 78                            | 2.7934376E 00,  | 2.8092644E 00,  | 2.8250693E 00,  | 2.8408539E 00,  | DATA 74  |
| 85  | 79                            | 2.8566189E 00,  | 2.8723657E 00,  | 2.8880936E 00,  | 2.9038099E 00,  | DATA 75  |
| 86  | DATA (RASUN 1), I=253, 288, / |                 |                 |                 |                 | DATA 76  |
| 87  | 81                            | 2.9195101E 00,  | 2.9351977E 00,  | 2.9508741E 00,  | 2.9665409E 00,  | DATA 77  |
| 88  | 82                            | 2.9821999E 00,  | 2.9978528E 00,  | 3.0135015E 00,  | 3.0291477E 00,  | DATA 78  |
| 89  | 83                            | 3.0447931E 00,  | 3.0604393E 00,  | 3.0760883E 00,  | 3.0917414E 00,  | DATA 79  |
| 90  | 84                            | 3.1073997E 00,  | 3.1230648E 00,  | 3.1387378E 00,  | 3.1544202E 00,  | DATA 80  |
| 91  | 85                            | 3.1701132E 00,  | 3.1858182E 00,  | 3.2015363E 00,  | 3.2172689E 00,  | DATA 81  |
| 92  | 86                            | 3.2330173E 00,  | 3.2487828E 00,  | 3.2645666E 00,  | 3.2803700E 00,  | DATA 82  |
| 93  | 87                            | 3.2961943E 00,  | 3.3120408E 00,  | 3.3279109E 00,  | 3.3438060E 00,  | DATA 83  |
| 94  | 88                            | 3.3597276E 00,  | 3.3756770E 00,  | 3.3916559E 00,  | 3.4076657E 00,  | DATA 84  |
| 95  | 89                            | 3.4237083E 00,  | 3.4397854E 00,  | 3.4558988E 00,  | 3.4720500E 00,  | DATA 85  |
| 96  | DATA (RASUN 1), I=289, 324, / |                 |                 |                 |                 | DATA 86  |
| 97  | 91                            | 3.4882409E 00,  | 3.5044729E 00,  | 3.5207476E 00,  | 3.5370664E 00,  | DATA 87  |
| 98  | 92                            | 3.5534305E 00,  | 3.5698408E 00,  | 3.5862937E 00,  | 3.6028054E 00,  | DATA 88  |
| 99  | 93                            | 3.6193618E 00,  | 3.6359688E 00,  | 3.6526274E 00,  | 3.6693383E 00,  | DATA 89  |
| 100 | 94                            | 3.6861024E 00,  | 3.7029203E 00,  | 3.7197923E 00,  | 3.7367197E 00,  | DATA 90  |
| 101 | 95                            | 3.7537023E 00,  | 3.7707411E 00,  | 3.7878354E 00,  | 3.8049888E 00,  | DATA 91  |
| 102 | 96                            | 3.8221988E 00,  | 3.8394670E 00,  | 3.8567938E 00,  | 3.8741798E 00,  | DATA 92  |
| 103 | 97                            | 3.8916257E 00,  | 3.9091321E 00,  | 3.9266997E 00,  | 3.9443288E 00,  | DATA 93  |
| 104 | 98                            | 3.9620200E 00,  | 3.9797736E 00,  | 3.9975899E 00,  | 4.0154689E 00,  | DATA 94  |
| 105 | 99                            | 4.0334105E 00,  | 4.0514143E 00,  | 4.0694807E 00,  | 4.0876089E 00,  | DATA 95  |
| 106 | DATA (RASUN 1), I=325, 360, / |                 |                 |                 |                 | DATA 96  |
| 107 | 101                           | 4.1057983E 00,  | 4.1240485E 00,  | 4.1423585E 00,  | 4.1607276E 00,  | DATA 97  |
| 108 | 102                           | 4.1791545E 00,  | 4.1976380E 00,  | 4.2161768E 00,  | 4.2347695E 00,  | DATA 98  |
| 109 | 103                           | 4.2534147E 00,  | 4.2721108E 00,  | 4.2908561E 00,  | 4.3096493E 00,  | DATA 99  |
| 110 | 104                           | 4.3284885E 00,  | 4.3473721E 00,  | 4.3662934E 00,  | 4.3852658E 00,  | DATA 100 |
| 111 | 105                           | 4.4042727E 00,  | 4.4233176E 00,  | 4.4423987E 00,  | 4.4615142E 00,  | DATA 101 |
| 112 | 106                           | 4.4806624E 00,  | 4.4998416E 00,  | 4.5190499E 00,  | 4.5382856E 00,  | DATA 102 |
| 113 | 107                           | 4.5575462E 00,  | 4.5768299E 00,  | 4.5961343E 00,  | 4.6154578E 00,  | DATA 103 |
| 114 | 108                           | 4.6347976E 00,  | 4.6541515E 00,  | 4.6735168E 00,  | 4.6928909E 00,  | DATA 104 |
| 115 | 109                           | 4.7122711E 00,  | 4.7316545E 00,  | 4.7510384E 00,  | 4.7704199E 00,  | DATA 105 |
| 116 | DATA (RASUN 1), I=361, 368, / |                 |                 |                 |                 | DATA 106 |
| 117 | 111                           | 4.7897962E 00,  | 4.8091643E 00,  | 4.8285221E 00,  | 4.8478664E 00,  | DATA 107 |
| 118 | 112                           | 4.8671947E 00,  | 4.8865044E 00,  | 4.9057931E 00,  | 4.9250585E 00,  | DATA 108 |
| 119 | DATA (BCSUN 1), I=1, 36, /    |                 |                 |                 |                 | DATA 108 |
| 120 | 121                           | -4.0333362E-01, | -4.0200667E-01, | -4.0054577E-01, | -3.9895162E-01, | DATA 109 |
| 121 | 122                           | -3.9722508E-01, | -3.9536703E-01, | -3.9337851E-01, | -3.9126045E-01, | DATA 110 |
| 122 | 123                           | -3.8901394E-01, | -3.8664018E-01, | -3.8414029E-01, | -3.8151560E-01, | DATA 111 |
| 123 | 124                           | -3.7876736E-01, | -3.7589693E-01, | -3.7290578E-01, | -3.6979540E-01, | DATA 112 |
| 124 | 125                           | -3.6656722E-01, | -3.6322275E-01, | -3.5976345E-01, | -3.5619085E-01, | DATA 113 |
| 125 | 126                           | -3.5250639E-01, | -3.4871168E-01, | -3.4480816E-01, | -3.4079745E-01, | DATA 114 |
| 126 | 127                           | -3.3668121E-01, | -3.3246120E-01, | -3.2813921E-01, | -3.2371707E-01, | DATA 115 |
| 127 | 128                           | -3.1919667E-01, | -3.1457994E-01, | -3.0986886E-01, | -3.0506535E-01, | DATA 116 |
| 128 | 129                           | -3.001714E-01,  | -2.9518926E-01, | -2.9012079E-01, | -2.8496807E-01, | DATA 117 |
| 129 | DATA (BCSUN 1), I=37, 72, /   |                 |                 |                 |                 | DATA 118 |
| 130 | 131                           | -2.7973324E-01, | -2.7441836E-01, | -2.6902552E-01, | -2.6355680E-01, | DATA 119 |
| 131 | 132                           | -2.5801429E-01, | -2.5240004E-01, | -2.4671614E-01, | -2.4096479E-01, | DATA 120 |
| 132 | 133                           | -2.3514787E-01, | -2.2926741E-01, | -2.2332537E-01, | -2.1732368E-01, | DATA 121 |
| 133 | 134                           | -2.1126416E-01, | -2.0514868E-01, | -1.9897909E-01, | -1.9275707E-01, | DATA 122 |
| 134 | 135                           | -1.8648465E-01, | -1.8016369E-01, | -1.7379600E-01, | -1.6738379E-01, | DATA 123 |
| 135 | 136                           | -1.6092879E-01, | -1.5443305E-01, | -1.4789857E-01, | -1.4132734E-01, | DATA 124 |
| 136 | 137                           | -1.3472140E-01, | -1.2808275E-01, | -1.2141343E-01, | -1.1471540E-01, | DATA 125 |
| 137 | 138                           | -1.0799071E-01, | -1.0124138E-01, | -9.4469375E-02, | -8.7676697E-02, | DATA 126 |
| 138 | 139                           | -8.0865259E-02, | -7.4037005E-02, | -6.7193867E-02, | -6.0337841E-02, | DATA 127 |
| 139 | DATA (BCSUN 1), I=73, 108, /  |                 |                 |                 |                 | DATA 128 |
| 140 | 141                           | -5.3470694E-02, | -4.6594233E-02, | -3.9710222E-02, | -3.2820411E-02, | DATA 129 |
| 141 | 142                           | -2.5926429E-02, | -1.9029902E-02, | -1.2132436E-02, | -5.2355946E-03, | DATA 130 |
| 142 | 143                           | 1.6589540E-03,  | 8.5495611E-03,  | 1.5434565E-02,  | 2.2312314E-02,  | DATA 131 |

|     |     |                                |                 |                 |                 |          |
|-----|-----|--------------------------------|-----------------|-----------------|-----------------|----------|
| 143 | 144 | 2.9181074E=02,                 | 3.6039120E=02,  | 4.2884709E=02,  | 4.9716109E=02,  | DATA 132 |
| 144 | 145 | 5.6531528E=02,                 | 6.3329183E=02,  | 7.0107286E=02,  | 7.6864121E=02,  | DATA 133 |
| 145 | 146 | 8.3297824E=02,                 | 9.0306607E=02,  | 9.6998701E=02,  | 1.0364234E=01,  | DATA 134 |
| 146 | 147 | 1.1026577E=01,                 | 1.1685723E=01,  | 1.2341498E=01,  | 1.2993716E=01,  | DATA 135 |
| 147 | 148 | 1.3642217E=01,                 | 1.4286835E=01,  | 1.4927406E=01,  | 1.5563770E=01,  | DATA 136 |
| 148 | 149 | 1.6195775E=01,                 | 1.6823271E=01,  | 1.7446109E=01,  | 1.8064144E=01,  | DATA 137 |
| 149 |     | DATA (BCSUN (I), I=109, 144, / |                 |                 |                 | DATA 138 |
| 150 | 151 | 1.8677221E=01,                 | 1.9285192E=01,  | 1.9887900E=01,  | 2.0485195E=01,  | DATA 139 |
| 151 | 152 | 2.1076920E=01,                 | 2.1662915E=01,  | 2.2243019E=01,  | 2.2817075E=01,  | DATA 140 |
| 152 | 153 | 2.3384915E=01,                 | 2.3946382E=01,  | 2.4501307E=01,  | 2.5049531E=01,  | DATA 141 |
| 153 | 154 | 2.5390890E=01,                 | 2.6125222E=01,  | 2.6652362E=01,  | 2.7172163E=01,  | DATA 142 |
| 154 | 155 | 2.7684459E=01,                 | 2.8189092E=01,  | 2.8685908E=01,  | 2.9174739E=01,  | DATA 143 |
| 155 | 156 | 2.9655444E=01,                 | 3.0127871E=01,  | 3.0591872E=01,  | 3.1047308E=01,  | DATA 144 |
| 156 | 157 | 3.1494040E=01,                 | 3.1931942E=01,  | 3.2360882E=01,  | 3.2780734E=01,  | DATA 145 |
| 157 | 158 | 3.3191371E=01,                 | 3.3592670E=01,  | 3.3984500E=01,  | 3.4366741E=01,  | DATA 146 |
| 158 | 159 | 3.4739266E=01,                 | 3.5101949E=01,  | 3.5454668E=01,  | 3.5797302E=01,  | DATA 147 |
| 159 |     | DATA (BCSUN (I), I=145, 180, / |                 |                 |                 | DATA 148 |
| 160 | 161 | 3.6129728E=01,                 | 3.6451827E=01,  | 3.6763481E=01,  | 3.7064575E=01,  | DATA 149 |
| 161 | 162 | 3.7355002E=01,                 | 3.7634654E=01,  | 3.7903433E=01,  | 3.8161242E=01,  | DATA 150 |
| 162 | 163 | 3.8407991E=01,                 | 3.8643595E=01,  | 3.8867962E=01,  | 3.9081011E=01,  | DATA 151 |
| 163 | 164 | 3.9282664E=01,                 | 3.9472843E=01,  | 3.9651483E=01,  | 3.9818515E=01,  | DATA 152 |
| 164 | 165 | 3.9973886E=01,                 | 4.0117546E=01,  | 4.0249449E=01,  | 4.0369553E=01,  | DATA 153 |
| 165 | 166 | 4.0477822E=01,                 | 4.0574221E=01,  | 4.0658718E=01,  | 4.0731283E=01,  | DATA 154 |
| 166 | 167 | 4.0791890E=01,                 | 4.0840517E=01,  | 4.0877147E=01,  | 4.0901762E=01,  | DATA 155 |
| 167 | 168 | 4.0914348E=01,                 | 4.0914902E=01,  | 4.0903415E=01,  | 4.0879693E=01,  | DATA 156 |
| 168 | 169 | 4.0844345E=01,                 | 4.0796784E=01,  | 4.0737243E=01,  | 4.0663745E=01,  | DATA 157 |
| 169 |     | DATA (BCSUN (I), I=181, 216, / |                 |                 |                 | DATA 158 |
| 170 | 171 | 4.0582337E=01,                 | 4.0487058E=01,  | 4.0379951E=01,  | 4.0261097E=01,  | DATA 159 |
| 171 | 172 | 4.0130518E=01,                 | 3.9988277E=01,  | 3.9834439E=01,  | 3.9669072E=01,  | DATA 160 |
| 172 | 173 | 3.9492246E=01,                 | 3.9304033E=01,  | 3.9104512E=01,  | 3.8893773E=01,  | DATA 161 |
| 173 | 174 | 3.8671891E=01,                 | 3.8438959E=01,  | 3.8195064E=01,  | 3.7940297E=01,  | DATA 162 |
| 174 | 175 | 3.7674748E=01,                 | 3.7398512E=01,  | 3.7111685E=01,  | 3.6814364E=01,  | DATA 163 |
| 175 | 176 | 3.6506647E=01,                 | 3.6188633E=01,  | 3.5860432E=01,  | 3.5522148E=01,  | DATA 164 |
| 176 | 177 | 3.5173896E=01,                 | 3.4815797E=01,  | 3.4447977E=01,  | 3.4070561E=01,  | DATA 165 |
| 177 | 178 | 3.3683694E=01,                 | 3.3287523E=01,  | 3.2882197E=01,  | 3.2467835E=01,  | DATA 166 |
| 178 | 179 | 3.2044606E=01,                 | 3.1612650E=01,  | 3.1172109E=01,  | 3.0723137E=01,  | DATA 167 |
| 179 |     | DATA (BCSUN (I), I=217, 252, / |                 |                 |                 | DATA 168 |
| 180 | 181 | 3.0265873E=01,                 | 2.9800468E=01,  | 2.9327063E=01,  | 2.8845813E=01,  | DATA 169 |
| 181 | 182 | 2.8356861E=01,                 | 2.7860355E=01,  | 2.7356439E=01,  | 2.6845254E=01,  | DATA 170 |
| 182 | 183 | 2.6326946E=01,                 | 2.5801655E=01,  | 2.5269519E=01,  | 2.4730681E=01,  | DATA 171 |
| 183 | 184 | 2.4185277E=01,                 | 2.3633447E=01,  | 2.3075329E=01,  | 2.2511057E=01,  | DATA 172 |
| 184 | 185 | 2.1940782E=01,                 | 2.1364656E=01,  | 2.0782829E=01,  | 2.0195449E=01,  | DATA 173 |
| 185 | 186 | 1.9602692E=01,                 | 1.9004724E=01,  | 1.8401716E=01,  | 1.7793826E=01,  | DATA 174 |
| 186 | 187 | 1.7181227E=01,                 | 1.6564086E=01,  | 1.5942566E=01,  | 1.5316842E=01,  | DATA 175 |
| 187 | 188 | 1.4687067E=01,                 | 1.4053406E=01,  | 1.3411019E=01,  | 1.2775071E=01,  | DATA 176 |
| 188 | 189 | 1.2130718E=01,                 | 1.1483119E=01,  | 1.0832429E=01,  | 1.0178803E=01,  | DATA 177 |
| 189 |     | DATA (BCSUN (I), I=253, 288, / |                 |                 |                 | DATA 178 |
| 190 | 191 | 9.5223930E=02,                 | 8.8633483E=02,  | 8.2018186E=02,  | 7.5379536E=02,  | DATA 179 |
| 191 | 192 | 6.8718951E=02,                 | 6.2037864E=02,  | 5.5337721E=02,  | 4.8619959E=02,  | DATA 180 |
| 192 | 193 | 4.1886110E=02,                 | 3.5137713E=02,  | 2.8376366E=02,  | 2.1603623E=02,  | DATA 181 |
| 193 | 194 | 1.4821286E=02,                 | 8.0310928E=03,  | 1.2347971E=03,  | 5.5658821E=03,  | DATA 182 |
| 194 | 195 | -1.2369150E=02,                | -1.9173238E=02, | -2.5976379E=02, | -3.2776758E=02, | DATA 183 |
| 195 | 196 | -3.9572665E=02,                | -4.6362336E=02, | -5.3143993E=02, | -5.9915844E=02, | DATA 184 |
| 196 | 197 | -6.6676154E=02,                | -7.3423178E=02, | -8.0155170E=02, | -8.6870384E=02, | DATA 185 |
| 197 | 198 | -9.3567109E=02,                | -1.0024363E=01, | -1.0689826E=01, | -1.1352923E=01, | DATA 186 |
| 198 | 199 | -1.2013497E=01,                | -1.2671380E=01, | -1.3326409E=01, | -1.3978414E=01, | DATA 187 |
| 199 |     | DATA (BCSUN (I), I=289, 324, / |                 |                 |                 | DATA 188 |
| 200 | 201 | -1.4627226E=01,                | -1.5272866E=01, | -1.5914555E=01, | -1.6552714E=01, | DATA 189 |
| 201 | 202 | -1.7186941E=01,                | -1.7817042E=01, | -1.8442814E=01, | -1.9064069E=01, | DATA 190 |
| 202 | 203 | -1.9680602E=01,                | -2.0292211E=01, | -2.0898703E=01, | -2.1499873E=01, | DATA 191 |
| 203 | 204 | -2.2095528E=01,                | -2.2685460E=01, | -2.3269474E=01, | -2.3847364E=01, | DATA 192 |
| 204 | 205 | -2.4418933E=01,                | -2.4983983E=01, | -2.5542314E=01, | -2.6093728E=01, | DATA 193 |
| 205 | 206 | -2.6638025E=01,                | -2.7175017E=01, | -2.7704503E=01, | -2.8226293E=01, | DATA 194 |
| 206 | 207 | -2.8740206E=01,                | -2.9246033E=01, | -2.9743652E=01, | -3.0232820E=01, | DATA 195 |
| 207 | 208 | -3.0713733E=01,                | -3.1185128E=01, | -3.1647892E=01, | -3.2101478E=01, | DATA 196 |
| 208 | 209 | -3.2545690E=01,                | -3.2980328E=01, | -3.3405201E=01, | -3.3820120E=01, | DATA 197 |
| 209 |     | DATA (BCSUN (I), I=325, 360, / |                 |                 |                 | DATA 198 |
| 210 | 211 | -3.4224898E=01,                | -3.4619351E=01, | -3.5003300E=01, | -3.5376570E=01, | DATA 199 |
| 211 | 212 | -3.5738986E=01,                | -3.6090380E=01, | -3.6443058E=01, | -3.6759432E=01, | DATA 200 |
| 212 | 213 | -3.7076767E=01,                | -3.7382432E=01, | -3.7676279E=01, | -3.7958157E=01, | DATA 201 |
| 213 | 214 | -3.8227930E=01,                | -3.8485461E=01, | -3.8730621E=01, | -3.8963286E=01, | DATA 202 |
| 214 | 215 | -3.9183340E=01,                | -3.9390672E=01, | -3.9585186E=01, | -3.9766780E=01, | DATA 203 |
| 215 | 216 | -3.9935360E=01,                | -4.0090843E=01, | -4.0233134E=01, | -4.0362152E=01, | DATA 204 |



|     |     |                              |                 |                 |                 |          |   |
|-----|-----|------------------------------|-----------------|-----------------|-----------------|----------|---|
| 216 | 217 | =4.0477815E-01,              | =4.0580043E-01, | =4.0668782E-01, | =4.0743958E-01, | DATA 205 |   |
| 217 | 218 | =4.0805532E-01,              | =4.0853464E-01, | =4.0887726E-01, | =4.0908295E-01, | DATA 206 |   |
| 218 | 219 | =4.0915158E-01,              | =4.0908312E-01, | =4.0887754E-01, | =4.0853491E-01/ | DATA 207 |   |
| 219 |     | DATA (RSUN (I), I=361, 368)/ |                 |                 |                 | DATA 208 | 6 |
| 220 | 221 | =4.0805545E-01,              | =4.0743933E-01, | =4.0668689E-01, | =4.0579846E-01, | DATA 209 |   |
| 221 | 222 | =4.0477457E-01,              | =4.0361568E-01, | =4.0232236E-01, | =4.0089529E-01/ | DATA 210 |   |
| 222 |     | DATA (RSUN (I), I=1, 36)/    |                 |                 |                 | DATA 210 | 6 |
| 223 | 231 | 9.8393993E-01,               | 9.8393163E-01,  | 9.8392755E-01,  | 9.8392748E-01,  | DATA 211 |   |
| 224 | 232 | 9.8393138E-01,               | 9.8393920E-01,  | 9.8395090E-01,  | 9.8396640E-01,  | DATA 212 |   |
| 225 | 233 | 9.8398588E-01,               | 9.8400944E-01,  | 9.8403728E-01,  | 9.8406943E-01,  | DATA 213 |   |
| 226 | 234 | 9.8410630E-01,               | 9.8414821E-01,  | 9.8419546E-01,  | 9.8424837E-01,  | DATA 214 |   |
| 227 | 235 | 9.8430716E-01,               | 9.8437207E-01,  | 9.8444331E-01,  | 9.8452122E-01,  | DATA 215 |   |
| 228 | 236 | 9.8460594E-01,               | 9.8469612E-01,  | 9.8479283E-01,  | 9.8489546E-01,  | DATA 216 |   |
| 229 | 237 | 9.8500376E-01,               | 9.8511744E-01,  | 9.8523617E-01,  | 9.8535961E-01,  | DATA 217 |   |
| 230 | 238 | 9.8548753E-01,               | 9.8561968E-01,  | 9.8575578E-01,  | 9.8589561E-01,  | DATA 218 |   |
| 231 | 239 | 9.8603895E-01,               | 9.8618562E-01,  | 9.8633544E-01,  | 9.8648823E-01/  | DATA 219 |   |
| 232 |     | DATA (RSUN (I), I=37, 72)/   |                 |                 |                 | DATA 220 | 6 |
| 233 | 241 | 9.8664402E-01,               | 9.8680282E-01,  | 9.8696467E-01,  | 9.8712949E-01,  | DATA 221 |   |
| 234 | 242 | 9.8729765E-01,               | 9.8746937E-01,  | 9.8764489E-01,  | 9.8782448E-01,  | DATA 222 |   |
| 235 | 243 | 9.8800837E-01,               | 9.8819683E-01,  | 9.8839006E-01,  | 9.8858842E-01,  | DATA 223 |   |
| 236 | 244 | 9.8879174E-01,               | 9.8900000E-01,  | 9.8921310E-01,  | 9.8943101E-01,  | DATA 224 |   |
| 237 | 245 | 9.8965342E-01,               | 9.8988006E-01,  | 9.9011064E-01,  | 9.9034484E-01,  | DATA 225 |   |
| 238 | 246 | 9.9058235E-01,               | 9.9082291E-01,  | 9.9106617E-01,  | 9.9131186E-01,  | DATA 226 |   |
| 239 | 247 | 9.9155965E-01,               | 9.9180924E-01,  | 9.9206039E-01,  | 9.9231277E-01,  | DATA 227 |   |
| 240 | 248 | 9.9256629E-01,               | 9.9282085E-01,  | 9.9307634E-01,  | 9.9333255E-01,  | DATA 228 |   |
| 241 | 249 | 9.9358977E-01,               | 9.9384820E-01,  | 9.9410799E-01,  | 9.9436934E-01/  | DATA 229 |   |
| 242 |     | DATA (RSUN (I), I=73, 108)/  |                 |                 |                 | DATA 230 | 6 |
| 243 | 251 | 9.9463250E-01,               | 9.9489775E-01,  | 9.9516527E-01,  | 9.9543545E-01,  | DATA 231 |   |
| 244 | 252 | 9.9570820E-01,               | 9.9598359E-01,  | 9.9626159E-01,  | 9.9654227E-01,  | DATA 232 |   |
| 245 | 253 | 9.9682540E-01,               | 9.9711075E-01,  | 9.9739811E-01,  | 9.9768723E-01,  | DATA 233 |   |
| 246 | 254 | 9.9797781E-01,               | 9.9826956E-01,  | 9.9856217E-01,  | 9.9885535E-01,  | DATA 234 |   |
| 247 | 255 | 9.9914873E-01,               | 9.9944195E-01,  | 9.9973471E-01,  | 1.000267E 00,   | DATA 235 |   |
| 248 | 256 | 1.0003176E 00,               | 1.0006072E 00,  | 1.0008953E 00,  | 1.0011815E 00,  | DATA 236 |   |
| 249 | 257 | 1.0014662E 00,               | 1.0017493E 00,  | 1.0020310E 00,  | 1.0023114E 00,  | DATA 237 |   |
| 250 | 258 | 1.0025908E 00,               | 1.0028695E 00,  | 1.0031477E 00,  | 1.0034257E 00,  | DATA 238 |   |
| 251 | 259 | 1.0037037E 00,               | 1.0039816E 00,  | 1.0042596E 00,  | 1.0045377E 00/  | DATA 239 |   |
| 252 |     | DATA (RSUN (I), I=109, 144)/ |                 |                 |                 | DATA 240 | 6 |
| 253 | 261 | 1.0048160E 00,               | 1.0050941E 00,  | 1.0053721E 00,  | 1.0056498E 00,  | DATA 241 |   |
| 254 | 262 | 1.0059269E 00,               | 1.0062032E 00,  | 1.0064784E 00,  | 1.0067523E 00,  | DATA 242 |   |
| 255 | 263 | 1.0070245E 00,               | 1.0072947E 00,  | 1.0075625E 00,  | 1.0078277E 00,  | DATA 243 |   |
| 256 | 264 | 1.0080898E 00,               | 1.0083486E 00,  | 1.0086038E 00,  | 1.0088548E 00,  | DATA 244 |   |
| 257 | 265 | 1.0091019E 00,               | 1.0093451E 00,  | 1.0095844E 00,  | 1.0098198E 00,  | DATA 245 |   |
| 258 | 266 | 1.0100516E 00,               | 1.0102801E 00,  | 1.0105055E 00,  | 1.0107203E 00,  | DATA 246 |   |
| 259 | 267 | 1.0109486E 00,               | 1.0111664E 00,  | 1.0113820E 00,  | 1.0115956E 00,  | DATA 247 |   |
| 260 | 268 | 1.0118071E 00,               | 1.0120166E 00,  | 1.0122239E 00,  | 1.0124291E 00,  | DATA 248 |   |
| 261 | 269 | 1.0126320E 00,               | 1.0128325E 00,  | 1.0130304E 00,  | 1.0132255E 00/  | DATA 249 |   |
| 262 |     | DATA (RSUN (I), I=145, 180)/ |                 |                 |                 | DATA 250 | 6 |
| 263 | 271 | 1.0134174E 00,               | 1.0136060E 00,  | 1.0137909E 00,  | 1.0139719E 00,  | DATA 251 |   |
| 264 | 272 | 1.0141485E 00,               | 1.0143204E 00,  | 1.0144873E 00,  | 1.0146487E 00,  | DATA 252 |   |
| 265 | 273 | 1.0148045E 00,               | 1.0149549E 00,  | 1.0150995E 00,  | 1.0152384E 00,  | DATA 253 |   |
| 266 | 274 | 1.0153719E 00,               | 1.0155002E 00,  | 1.0156236E 00,  | 1.0157425E 00,  | DATA 254 |   |
| 267 | 275 | 1.0158571E 00,               | 1.0159676E 00,  | 1.0160742E 00,  | 1.0161772E 00,  | DATA 255 |   |
| 268 | 276 | 1.0162766E 00,               | 1.0163727E 00,  | 1.0164654E 00,  | 1.0165547E 00,  | DATA 256 |   |
| 269 | 277 | 1.0166408E 00,               | 1.0167235E 00,  | 1.0168027E 00,  | 1.0168783E 00,  | DATA 257 |   |
| 270 | 278 | 1.0169502E 00,               | 1.0170182E 00,  | 1.0170819E 00,  | 1.0171413E 00,  | DATA 258 |   |
| 271 | 279 | 1.0171959E 00,               | 1.0172453E 00,  | 1.0172893E 00,  | 1.0173274E 00/  | DATA 259 |   |
| 272 |     | DATA (RSUN (I), I=181, 216)/ |                 |                 |                 | DATA 260 | 6 |
| 273 | 281 | 1.0173595E 00,               | 1.0173855E 00,  | 1.0174052E 00,  | 1.0174182E 00,  | DATA 261 |   |
| 274 | 282 | 1.0174250E 00,               | 1.0174259E 00,  | 1.0174209E 00,  | 1.0174105E 00,  | DATA 262 |   |
| 275 | 283 | 1.0173949E 00,               | 1.0173744E 00,  | 1.0173493E 00,  | 1.0173198E 00,  | DATA 263 |   |
| 276 | 284 | 1.0172863E 00,               | 1.0172488E 00,  | 1.0172075E 00,  | 1.0171626E 00,  | DATA 264 |   |
| 277 | 285 | 1.0171142E 00,               | 1.0170623E 00,  | 1.0170070E 00,  | 1.0169483E 00,  | DATA 265 |   |
| 278 | 286 | 1.0168860E 00,               | 1.0168201E 00,  | 1.0167504E 00,  | 1.0166768E 00,  | DATA 266 |   |
| 279 | 287 | 1.0165989E 00,               | 1.0165165E 00,  | 1.0164293E 00,  | 1.0163368E 00,  | DATA 267 |   |
| 280 | 288 | 1.0162390E 00,               | 1.0161356E 00,  | 1.0160263E 00,  | 1.0159109E 00,  | DATA 268 |   |
| 281 | 289 | 1.0157896E 00,               | 1.0156625E 00,  | 1.0155299E 00,  | 1.0153919E 00/  | DATA 269 |   |
| 282 |     | DATA (RSUN (I), I=217, 252)/ |                 |                 |                 | DATA 270 | 6 |
| 283 | 291 | 1.0152488E 00,               | 1.0151010E 00,  | 1.0149488E 00,  | 1.0147925E 00,  | DATA 271 |   |
| 284 | 292 | 1.0146325E 00,               | 1.0144688E 00,  | 1.0143019E 00,  | 1.0141319E 00,  | DATA 272 |   |
| 285 | 293 | 1.0139590E 00,               | 1.0137834E 00,  | 1.0136053E 00,  | 1.0134247E 00,  | DATA 273 |   |
| 286 | 294 | 1.0132418E 00,               | 1.0130563E 00,  | 1.0128684E 00,  | 1.0126780E 00,  | DATA 274 |   |
| 287 | 295 | 1.0124848E 00,               | 1.0122886E 00,  | 1.0120891E 00,  | 1.0118861E 00,  | DATA 275 |   |
| 288 | 296 | 1.0116792E 00,               | 1.0114684E 00,  | 1.0112533E 00,  | 1.0110335E 00,  | DATA 276 |   |

|     |     |                              |                |                |                 |          |   |
|-----|-----|------------------------------|----------------|----------------|-----------------|----------|---|
| 289 | 297 | 1.0108092E 00,               | 1.0105806E 00, | 1.0103477E 00, | 1.0101105E 00,  | DATA 277 |   |
| 290 | 298 | 1.0098694E 00,               | 1.0096247E 00, | 1.0093767E 00, | 1.0091257E 00,  | DATA 278 |   |
| 291 | 299 | 1.0088721E 00,               | 1.0086160E 00, | 1.0083580E 00, | 1.0080981E 00,  | DATA 279 |   |
| 292 |     | DATA (RSUN (1),1)=253.288)/  |                |                |                 | DATA 280 | 6 |
| 293 | 301 | 1.0078368E 00,               | 1.0075743E 00, | 1.0073108E 00, | 1.0070466E 00,  | DATA 281 |   |
| 294 | 302 | 1.0067817E 00,               | 1.0065164E 00, | 1.0062503E 00, | 1.0059844E 00,  | DATA 282 |   |
| 295 | 303 | 1.0057176E 00,               | 1.0054501E 00, | 1.0051816E 00, | 1.0049120E 00,  | DATA 283 |   |
| 296 | 304 | 1.0046410E 00,               | 1.0043683E 00, | 1.0040938E 00, | 1.0038169E 00,  | DATA 284 |   |
| 297 | 305 | 1.0035379E 00,               | 1.0032566E 00, | 1.0029732E 00, | 1.0026875E 00,  | DATA 285 |   |
| 298 | 306 | 1.0023998E 00,               | 1.0021104E 00, | 1.0018195E 00, | 1.0015274E 00,  | DATA 286 |   |
| 299 | 307 | 1.0012345E 00,               | 1.0009409E 00, | 1.0006470E 00, | 1.0003532E 00,  | DATA 287 |   |
| 300 | 308 | 1.0000597E 00,               | 9.9976698E-01, | 9.9947527E-01, | 9.9918488E-01,  | DATA 288 |   |
| 301 | 309 | 9.9889604E-01,               | 9.9860895E-01, | 9.9832381E-01, | 9.9804087E-01,  | DATA 289 |   |
| 302 |     | DATA (RSUN (1),1)=259.324)/  |                |                |                 | DATA 290 | 6 |
| 303 | 311 | 9.9775995E-01,               | 9.9748093E-01, | 9.9720366E-01, | 9.9692807E-01,  | DATA 291 |   |
| 304 | 312 | 9.9665385E-01,               | 9.9638075E-01, | 9.9610849E-01, | 9.9583677E-01,  | DATA 292 |   |
| 305 | 313 | 9.9556555E-01,               | 9.9529471E-01, | 9.9502421E-01, | 9.9475390E-01,  | DATA 293 |   |
| 306 | 314 | 9.9448397E-01,               | 9.9421456E-01, | 9.9394584E-01, | 9.9367797E-01,  | DATA 294 |   |
| 307 | 315 | 9.9341123E-01,               | 9.9314588E-01, | 9.9288217E-01, | 9.9262041E-01,  | DATA 295 |   |
| 308 | 316 | 9.9236095E-01,               | 9.9210411E-01, | 9.9185023E-01, | 9.9159960E-01,  | DATA 296 |   |
| 309 | 317 | 9.9135257E-01,               | 9.9110944E-01, | 9.9087047E-01, | 9.9063607E-01,  | DATA 297 |   |
| 310 | 318 | 9.9040610E-01,               | 9.9018052E-01, | 9.8995929E-01, | 9.8974243E-01,  | DATA 298 |   |
| 311 | 319 | 9.8952959E-01,               | 9.8932052E-01, | 9.8911493E-01, | 9.8891246E-01,  | DATA 299 |   |
| 312 |     | DATA (RSUN (1),1)=325.360)/  |                |                |                 | DATA 300 | 6 |
| 313 | 321 | 9.8871303E-01,               | 9.8851644E-01, | 9.8832256E-01, | 9.8813118E-01,  | DATA 301 |   |
| 314 | 322 | 9.8794237E-01,               | 9.8775616E-01, | 9.8757259E-01, | 9.8739172E-01,  | DATA 302 |   |
| 315 | 323 | 9.8721373E-01,               | 9.8703878E-01, | 9.8686709E-01, | 9.8669884E-01,  | DATA 303 |   |
| 316 | 324 | 9.8653433E-01,               | 9.8637386E-01, | 9.8621771E-01, | 9.8606608E-01,  | DATA 304 |   |
| 317 | 325 | 9.8591944E-01,               | 9.8577810E-01, | 9.8564237E-01, | 9.8551270E-01,  | DATA 305 |   |
| 318 | 326 | 9.8538905E-01,               | 9.8527152E-01, | 9.8516010E-01, | 9.8505504E-01,  | DATA 306 |   |
| 319 | 327 | 9.8495586E-01,               | 9.8486236E-01, | 9.8477422E-01, | 9.8469105E-01,  | DATA 307 |   |
| 320 | 328 | 9.8461272E-01,               | 9.8453876E-01, | 9.8446954E-01, | 9.8440415E-01,  | DATA 308 |   |
| 321 | 329 | 9.8434277E-01,               | 9.8428529E-01, | 9.8423166E-01, | 9.8418178E-01,  | DATA 309 |   |
| 322 |     | DATA (RSUN (1),1)=361.368)/  |                |                |                 | DATA 310 | 6 |
| 323 | 331 | 9.8413575E-01,               | 9.8409360E-01, | 9.8405541E-01, | 9.8402127E-01,  | DATA 311 |   |
| 324 | 332 | 9.8399139E-01,               | 9.8396596E-01, | 9.8394520E-01, | 9.8392923E-01,  | DATA 312 |   |
| 325 |     | DATA (RAMOON(1),1)=1.36)/    |                |                |                 | DATA 313 | 6 |
| 326 | 341 | 3.9262257E 00,               | 4.1456257E 00, | 4.3716755E 00, | 4.6017005E 00,  | DATA 314 |   |
| 327 | 342 | 4.8320243E 00,               | 5.0590464E 00, | 5.2802947E 00, | 5.4950165E 00,  | DATA 315 |   |
| 328 | 343 | 5.7042153E 00,               | 5.9103500E 00, | 6.1169520E 00, | 6.3094914E 02,  | DATA 316 |   |
| 329 | 344 | 2.6577257E 01,               | 5.0020875E-01, | 7.5153591E-01, | 1.0199767E 00,  | DATA 317 |   |
| 330 | 345 | 1.3012705E 00,               | 1.5867303E 00, | 1.8660258E 00, | 2.1311788E 00,  | DATA 318 |   |
| 331 | 346 | 2.3788143E 00,               | 2.6097481E 00, | 2.8273089E 00, | 3.0358215E 00,  | DATA 319 |   |
| 332 | 347 | 3.2396933E 00,               | 3.4429523E 00, | 3.6489778E 00, | 3.8602468E 00,  | DATA 320 |   |
| 333 | 348 | 4.0780343E 00,               | 4.3021402E 00, | 4.5308340E 00, | 4.7612216E 00,  | DATA 321 |   |
| 334 | 349 | 4.9900503E 00,               | 5.2146716E 00, | 5.4337639E 00, | 5.6475902E 00,  | DATA 322 |   |
| 335 |     | DATA (RAMOON(1),1)=37.72)/   |                |                |                 | DATA 323 | 6 |
| 336 | 351 | 5.8578619E 00,               | 6.0674140E 00, | 6.2798446E 00, | 6.494985E-01,   | DATA 324 |   |
| 337 | 352 | 4.4595623E-01,               | 6.8959696E-01, | 9.4766763E-01, | 1.2176310E 00,  | DATA 325 |   |
| 338 | 353 | 1.4933431E 00,               | 1.7666221E 00, | 2.0301391E 00, | 2.2797165E 00,  | DATA 326 |   |
| 339 | 354 | 2.5147694E 00,               | 2.7373483E 00, | 2.9508713E 00, | 3.1591684E 00,  | DATA 327 |   |
| 340 | 355 | 3.3659052E 00,               | 3.5742357E 00, | 3.7865318E 00, | 4.0041212E 00,  | DATA 328 |   |
| 341 | 356 | 4.2270713E 00,               | 4.4541460E 00, | 4.6830826E 00, | 4.9112150E 00,  | DATA 329 |   |
| 342 | 357 | 5.1362575E 00,               | 5.3569531E 00, | 5.5733826E 00, | 5.7869359E 00,  | DATA 330 |   |
| 343 | 358 | 6.0000789E 00,               | 6.2160344E 00, | 6.4321633E-01, | 6.6474714E-01,  | DATA 331 |   |
| 344 | 359 | 6.3205145E-01,               | 6.5951482E-01, | 6.872841E 00,  | 7.15296523E 00, | DATA 332 |   |
| 345 |     | DATA (RAMOON(1),1)=73.108)/  |                |                |                 | DATA 333 | 6 |
| 346 | 361 | 1.6992279E 00,               | 1.9594557E 00, | 2.2065906E 00, | 2.4401033E 00,  | DATA 334 |   |
| 347 | 362 | 2.6418806E 00,               | 2.8751182E 00, | 3.0834467E 00, | 3.2903734E 00,  | DATA 335 |   |
| 348 | 363 | 3.4989215E 00,               | 3.7113434E 00, | 3.9288518E 00, | 4.1514152E 00,  | DATA 336 |   |
| 349 | 364 | 4.3777431E 00,               | 4.6055918E 00, | 4.8323915E 00, | 5.0560015E 00,  | DATA 337 |   |
| 350 | 365 | 5.2753134E 00,               | 5.4905267E 00, | 5.7031131E 00, | 5.9156160E 00,  | DATA 338 |   |
| 351 | 366 | 6.1313500E 00,               | 7.0895639E-02, | 7.0432923E-01, | 7.5128188E-01,  | DATA 339 |   |
| 352 | 367 | 8.1245285E-01,               | 1.0851635E 00, | 1.3630673E 00, | 1.6377763E 00,  | DATA 340 |   |
| 353 | 368 | 1.9018475E 00,               | 2.1311216E 00, | 2.3831294E 00, | 2.6060769E 00,  | DATA 341 |   |
| 354 | 369 | 2.8175451E 00,               | 3.0235254E 00, | 3.2278435E 00, | 3.4338204E 00,  | DATA 342 | 6 |
| 355 |     | DATA (RAMOON(1),1)=109.144)/ |                |                |                 | DATA 343 |   |
| 356 | 371 | 3.6439674E 00,               | 3.8597137E 00, | 4.0811378E 00, | 4.3068929E 00,  | DATA 344 |   |
| 357 | 372 | 4.5344892E 00,               | 4.7609728E 00, | 4.9837940E 00, | 5.2015204E 00,  | DATA 345 |   |
| 358 | 373 | 5.4141673E 00,               | 5.6231602E 00, | 5.8311027E 00, | 6.0414991E 00,  | DATA 346 |   |
| 359 | 374 | 6.2984734E 00,               | 6.5020044E-01, | 6.7095935E-01, | 6.9269841E-01,  | DATA 347 |   |
| 360 | 375 | 7.1819828E-01,               | 1.2653367E 00, | 1.5520923E 00, | 1.8379834E 00,  | DATA 348 |   |
| 361 | 376 | 2.0877281E 00,               | 2.3295512E 00, | 2.5553615E 00, | 2.7690249E 00,  | DATA 349 |   |



|     |                             |                 |                 |                 |                 |          |
|-----|-----------------------------|-----------------|-----------------|-----------------|-----------------|----------|
| 362 | 377                         | 2.9750357E 00,  | 3.1777681E 00,  | 3.8810834E 00,  | 3.5880678E 00,  | DATA 349 |
| 363 | 378                         | 3.8007246E 00,  | 4.0196828E 00,  | 4.2439891E 00,  | 4.4712421E 00,  | DATA 350 |
| 364 | 379                         | 4.6981968E 00,  | 4.9217089E 00,  | 5.1396382E 00,  | 5.3513437E 00,  | DATA 351 |
| 365 | DATA (RAMOQN1), I=145,180,/ |                 |                 |                 |                 | DATA 352 |
| 366 | 381                         | 5.5578389E 00,  | 5.7613614E 00,  | 5.9652732E 00,  | 6.1737020E 00,  | DATA 353 |
| 367 | 382                         | 1.0809371E-01,  | 3.3952975E-01,  | 5.8868911E-01,  | 8.5690016E-01,  | DATA 354 |
| 368 | 383                         | 1.1412590E 00,  | 1.4332261E 00,  | 1.7214760E 00,  | 1.9961264E 00,  | DATA 355 |
| 369 | 384                         | 2.2321742E 00,  | 2.4896467E 00,  | 2.7117722E 00,  | 2.9231358E 00,  | DATA 356 |
| 370 | 385                         | 3.1285014E 00,  | 3.3322294E 00,  | 3.5379620E 00,  | 3.7483854E 00,  | DATA 357 |
| 371 | 386                         | 3.9647752E 00,  | 4.1870223E 00,  | 4.4132906E 00,  | 4.6403615E 00,  | DATA 358 |
| 372 | 387                         | 4.8654510E 00,  | 5.0852039E 00,  | 5.2984215E 00,  | 5.5053104E 00,  | DATA 359 |
| 373 | 388                         | 5.7075413E 00,  | 5.9079482E 00,  | 6.1102397E 00,  | 6.3277491E-02,  | DATA 360 |
| 374 | 389                         | 2.5303468E-01,  | 4.0993762E-01,  | 7.4349377E-01,  | 1.01508254E 00, | DATA 361 |
| 375 | DATA (RAMOQN1), I=181,216,/ |                 |                 |                 |                 | DATA 362 |
| 376 | 391                         | 1.3022128E 00,  | 1.5931698E 00,  | 1.8775871E 00,  | 2.1471343E 00,  | DATA 363 |
| 377 | 392                         | 2.3985570E 00,  | 2.6330232E 00,  | 2.8542118E 00,  | 3.0668668E 00,  | DATA 364 |
| 378 | 393                         | 3.2749461E 00,  | 3.4829349E 00,  | 3.6937405E 00,  | 3.9093107E 00,  | DATA 365 |
| 379 | 394                         | 4.1301816E 00,  | 4.3553419E 00,  | 4.5824339E 00,  | 4.8083831E 00,  | DATA 366 |
| 380 | 395                         | 5.0302994E 00,  | 5.2462902E 00,  | 5.4558918E 00,  | 5.6600848E 00,  | DATA 367 |
| 381 | 396                         | 5.8610617E 00,  | 6.0619376E 00,  | 6.2664948E 00,  | 1.9574968E-01,  | DATA 368 |
| 382 | 397                         | 4.2031804E-01,  | 6.6058335E-01,  | 9.1820061E-01,  | 1.1913895E 00,  | DATA 369 |
| 383 | 398                         | 1.4739403E 00,  | 1.7567654E 00,  | 2.0309078E 00,  | 2.2908099E 00,  | DATA 370 |
| 384 | 399                         | 2.5351883E 00,  | 2.7659905E 00,  | 2.9968270E 00,  | 3.2017680E 00,  | DATA 371 |
| 385 | DATA (RAMOQN1), I=217,252,/ |                 |                 |                 |                 | DATA 372 |
| 386 | 401                         | 3.4146269E 00,  | 3.6283407E 00,  | 3.8456652E 00,  | 4.0669280E 00,  | DATA 373 |
| 387 | 402                         | 4.2918797E 00,  | 4.5188161E 00,  | 4.7452332E 00,  | 4.9685800E 00,  | DATA 374 |
| 388 | 403                         | 5.1868986E 00,  | 5.3995087E 00,  | 5.6069363E 00,  | 5.8108784E 00,  | DATA 375 |
| 389 | 404                         | 6.0139359E 00,  | 6.2193588E 00,  | 1.4760300E-01,  | 3.6873097E-01,  | DATA 376 |
| 390 | 405                         | 6.0273313E-01,  | 8.5135783E-01,  | 1.1137827E 00,  | 1.3858489E 00,  | DATA 377 |
| 391 | 406                         | 1.6406207E 00,  | 1.9305508E 00,  | 2.1900524E 00,  | 2.4368402E 00,  | DATA 378 |
| 392 | 407                         | 2.6716437E 00,  | 2.8970925E 00,  | 3.1166059E 00,  | 3.3336022E 00,  | DATA 379 |
| 393 | 408                         | 3.5809856E 00,  | 3.7707900E 00,  | 3.9939199E 00,  | 4.2200286E 00,  | DATA 380 |
| 394 | 409                         | 4.4476367E 00,  | 4.6745537E 00,  | 4.8985248E 00,  | 5.1178849E 00,  | DATA 381 |
| 395 | DATA (RAMOQN1), I=253,288,/ |                 |                 |                 |                 | DATA 382 |
| 396 | 411                         | 5.3319939E 00,  | 5.5413706E 00,  | 5.7475906E 00,  | 5.9530729E 00,  | DATA 383 |
| 397 | 412                         | 6.1808404E 00,  | 9.1074832E-02,  | 3.1330802E-01,  | 5.4772394E-01,  | DATA 384 |
| 398 | 413                         | 7.9521190E-01,  | 1.0549029E 00,  | 1.8229000E 00,  | 1.5929257E 00,  | DATA 385 |
| 399 | 414                         | 1.8582610E 00,  | 2.1139410E 00,  | 2.3579170E 00,  | 2.5908583E 00,  | DATA 386 |
| 400 | 415                         | 2.8152187E 00,  | 3.0342548E 00,  | 3.2512814E 00,  | 3.4691498E 00,  | DATA 387 |
| 401 | 416                         | 3.6898529E 00,  | 3.9142218E 00,  | 4.1417732E 00,  | 4.3708302E 00,  | DATA 388 |
| 402 | 417                         | 4.5989881E 00,  | 4.8238248E 00,  | 5.0436009E 00,  | 5.2577002E 00,  | DATA 389 |
| 403 | 418                         | 5.4667372E 00,  | 5.6724204E 00,  | 5.8773187E 00,  | 6.0846222E 00,  | DATA 390 |
| 404 | 419                         | 1.4709324E-02,  | 2.3755080E-01,  | 4.7302534E-01,  | 7.2274096E-01,  | DATA 391 |
| 405 | DATA (RAMOQN1), I=289,324,/ |                 |                 |                 |                 | DATA 392 |
| 406 | 421                         | 9.8570479E-01,  | 1.2575892E 00,  | 1.5313502E 00,  | 1.7994398E 00,  | DATA 393 |
| 407 | 422                         | 2.0363687E 00,  | 2.2999993E 00,  | 2.5312268E 00,  | 2.7528693E 00,  | DATA 394 |
| 408 | 423                         | 2.9685805E 00,  | 3.1820787E 00,  | 3.3966302E 00,  | 3.6146464E 00,  | DATA 395 |
| 409 | 424                         | 3.8373259E 00,  | 4.0643954E 00,  | 4.2941179E 00,  | 4.5237171E 00,  | DATA 396 |
| 410 | 425                         | 4.7501780E 00,  | 4.9711309E 00,  | 5.1854634E 00,  | 5.3939054E 00,  | DATA 397 |
| 411 | 426                         | 5.5968820E 00,  | 5.7982335E 00,  | 6.0009466E 00,  | 6.2089280E 00,  | DATA 398 |
| 412 | 427                         | 1.4312887E-01,  | 3.7397303E-01,  | 6.2106165E-01,  | 8.8483180E-01,  | DATA 399 |
| 413 | 428                         | 1.1618112E 00,  | 1.4444738E 00,  | 1.7233703E 00,  | 1.9906342E 00,  | DATA 400 |
| 414 | 429                         | 2.2423790E 00,  | 2.4787632E 00,  | 2.7026306E 00,  | 2.9180461E 00,  | DATA 401 |
| 415 | DATA (RAMOQN1), I=325,360,/ |                 |                 |                 |                 | DATA 402 |
| 416 | 431                         | 3.1292897E 00,  | 3.3402602E 00,  | 3.5540744E 00,  | 3.7727039E 00,  | DATA 403 |
| 417 | 432                         | 3.9966386E 00,  | 4.2247159E 00,  | 4.4543301E 00,  | 4.6821325E 00,  | DATA 404 |
| 418 | 433                         | 4.9050192E 00,  | 5.1209973E 00,  | 5.3296077E 00,  | 5.5318946E 00,  | DATA 405 |
| 419 | 434                         | 5.7301272E 00,  | 5.9274886E 00,  | 6.1278348E 00,  | 5.2317245E-02,  | DATA 406 |
| 420 | 435                         | 2.7185243E-01,  | 5.0743400E-01,  | 7.6117304E-01,  | 1.0341788E 00,  | DATA 407 |
| 421 | 436                         | 1.3195081E 00,  | 1.6082189E 00,  | 1.8898423E 00,  | 2.1569484E 00,  | DATA 408 |
| 422 | 437                         | 2.4069645E 00,  | 2.6413696E 00,  | 2.8638859E 00,  | 3.0790059E 00,  | DATA 409 |
| 423 | 438                         | 3.2910582E 00,  | 3.5037446E 00,  | 3.7197609E 00,  | 3.9404729E 00,  | DATA 410 |
| 424 | 439                         | 4.1656665E 00,  | 4.3935522E 00,  | 4.6212032E 00,  | 4.8453966E 00,  | DATA 411 |
| 425 | DATA (RAMOQN1), I=361,368,/ |                 |                 |                 |                 | DATA 412 |
| 426 | 441                         | 5.0435530E 00,  | 5.2743903E 00,  | 5.4781197E 00,  | 5.6762863E 00,  | DATA 413 |
| 427 | 442                         | 5.8714746E 00,  | 6.0670382E 00,  | 6.2669036E 00,  | 1.9220380E-01,  | DATA 414 |
| 428 | DATA (RAMOQN1), I=1,36,/    |                 |                 |                 |                 | DATA 415 |
| 429 | 451                         | -3.7898502E-01, | -4.1903623E-01, | -4.4071419E-01, | -4.4239708E-01, | DATA 416 |
| 430 | 452                         | -4.2348881E-01, | -3.8466371E-01, | -3.2778018E-01, | -2.5557062E-01, | DATA 417 |
| 431 | 453                         | -1.7127786E-01, | -7.8397205E-02, | -1.9400469E-02, | -1.1816310E-01, | DATA 418 |
| 432 | 454                         | -2.1341612E-01, | -2.9988632E-01, | -3.7139361E-01, | -4.2124538E-01, | DATA 419 |
| 433 | 455                         | -4.4345056E-01, | -4.3458230E-01, | -3.9526432E-01, | -3.8011600E-01, | DATA 420 |
| 434 | 456                         | -2.4617799E-01, | -1.5097797E-01, | -5.1223697E-02, | -4.7681224E-02, | DATA 421 |

|     |     |                               |                 |                 |                 |          |
|-----|-----|-------------------------------|-----------------|-----------------|-----------------|----------|
| 435 | 457 | =1.4156317E-01,               | =2.2715631E-01, | =3.0174243E-01, | =3.6287296E-01, | DATA 421 |
| 436 | 458 | =4.0824197E-01,               | =4.3574570E-01, | =4.6371715E-01, | =4.8125242E-01, | DATA 422 |
| 437 | 459 | =3.9848502E-01,               | =3.4668137E-01, | =2.7813100E-01, | =1.9591508E-01, | DATA 423 |
| 438 |     | DATA (BCMOQN(I),I)=37,72,/,   |                 |                 |                 | DATA 424 |
| 439 | 461 | =1.0366988E-01,               | =5.4267507E-03, | =9.4443663E-02, | =1.9119536E-01, | DATA 425 |
| 440 | 462 | =2.7963215E-01,               | =3.5410865E-01, | =4.0880257E-01, | =4.3846453E-01, | DATA 426 |
| 441 | 463 | =4.3962187E-01,               | =4.1172891E-01, | =3.5750724E-01, | =2.8220963E-01, | DATA 427 |
| 442 | 464 | =1.9231630E-01,               | =9.4364719E-02, | =5.7534319E-03, | =1.8305513E-01, | DATA 428 |
| 443 | 465 | =1.9344329E-01,               | =2.7354635E-01, | =3.4053203E-01, | =3.9197689E-01, | DATA 429 |
| 444 | 466 | =4.2584366E-01,               | =4.4057786E-01, | =4.8528014E-01, | =4.8987058E-01, | DATA 430 |
| 445 | 467 | =3.6516557E-01,               | =3.0284810E-01, | =2.2537895E-01, | =1.8591623E-01, | DATA 431 |
| 446 | 468 | =3.8279797E-02,               | =6.3048565E-02, | =1.6292838E-01, | =2.5562457E-01, | DATA 432 |
| 447 | 469 | =3.3501450E-01,               | =3.9505250E-01, | =4.5057969E-01, | =4.8836846E-01, | DATA 433 |
| 448 |     | DATA (BCMOQN(I),I)=73,108,/,  |                 |                 |                 | DATA 434 |
| 449 | 471 | =4.1795634E-01,               | =3.7173964E-01, | =3.0424625E-01, | =2.2106244E-01, | DATA 435 |
| 450 | 472 | =1.2794594E-01,               | =3.0324169E-02, | =6.0899313E-01, | =1.5937245E-01, | DATA 436 |
| 451 | 473 | =2.4326049E-01,               | =3.1520975E-01, | =3.7234745E-01, | =4.4234002E-01, | DATA 437 |
| 452 | 474 | =4.3350593E-01,               | =4.3494042E-01, | =4.1658241E-01, | =3.2917826E-01, | DATA 438 |
| 453 | 475 | =3.2416091E-01,               | =2.5352281E-01, | =1.0976635E-01, | =7.5972697E-02, | DATA 439 |
| 454 | 476 | =2.4029933E-02,               | =1.2547066E-01, | =2.2253206E-01, | =3.0849740E-01, | DATA 440 |
| 455 | 477 | =3.7632741E-01,               | =4.1976317E-01, | =4.3474875E-01, | =4.2052066E-01, | DATA 441 |
| 456 | 478 | =3.7964646E-01,               | =3.1698097E-01, | =2.3827544E-01, | =1.4916466E-01, | DATA 442 |
| 457 | 479 | =5.4730843E-02,               | =4.0532154E-02, | =1.3259001E-01, | =2.1773131E-01, | DATA 443 |
| 458 |     | DATA (BCMOQN(I),I)=189,144,/, |                 |                 |                 | DATA 444 |
| 459 | 481 | =2.9250117E-01,               | =3.5373865E-01, | =3.9872190E-01, | =4.2539091E-01, | DATA 445 |
| 460 | 482 | =4.3257060E-01,               | =4.2008775E-01, | =3.8871014E-01, | =3.3993154E-01, | DATA 446 |
| 461 | 483 | =2.7871466E-01,               | =1.9831970E-01, | =1.029729E-01,  | =1.4659752E-02, | DATA 447 |
| 462 | 484 | =8.4809179E-02,               | =1.8320014E-01, | =2.7425573E-01, | =3.5056611E-01, | DATA 448 |
| 463 | 485 | =4.0451222E-01,               | =4.3002816E-01, | =4.252750E-01,  | =3.8973461E-01, | DATA 449 |
| 464 | 486 | =3.3075890E-01,               | =2.5418262E-01, | =1.6644206E-01, | =7.3068686E-02, | DATA 450 |
| 465 | 487 | =2.1382454E-02,               | =1.1308695E-01, | =1.9365116E-01, | =2.7489312E-01, | DATA 451 |
| 466 | 488 | =3.3876554E-01,               | =3.8744666E-01, | =4.1858409E-01, | =4.3061516E-01, | DATA 452 |
| 467 | 489 | =4.2302532E-01,               | =3.9640457E-01, | =3.5226418E-01, | =2.9271100E-01, | DATA 453 |
| 468 |     | DATA (BCMOQN(I),I)=145,180,/, |                 |                 |                 | DATA 454 |
| 469 | 491 | =2.2014089E-01,               | =1.3707806E-01, | =4.4209590E-02, | =4.9391784E-02, | DATA 455 |
| 470 | 492 | =1.4590029E-01,               | =2.3831965E-01, | =3.2022071E-01, | =3.8400849E-01, | DATA 456 |
| 471 | 493 | =4.2215449E-01,               | =4.2938609E-01, | =4.0476465E-01, | =3.9205796E-01, | DATA 457 |
| 472 | 494 | =2.7808345E-01,               | =1.9041456E-01, | =9.5798021E-02, | =3.4680493E-04, | DATA 458 |
| 473 | 495 | =9.3796602E-02,               | =1.8114034E-01, | =2.5940874E-01, | =3.2583274E-01, | DATA 459 |
| 474 | 496 | =3.7778311E-01,               | =4.1290626E-01, | =4.2941659E-01, | =4.2642868E-01, | DATA 460 |
| 475 | 497 | =4.0416432E-01,               | =3.6391639E-01, | =3.0778767E-01, | =2.3834343E-01, | DATA 461 |
| 476 | 498 | =1.5833302E-01,               | =7.0573555E-02, | =2.1982959E-02, | =1.1601785E-01, | DATA 462 |
| 477 | 499 | =2.0749573E-01,               | =2.9129643E-01, | =3.6105308E-01, | =4.0958917E-01, | DATA 463 |
| 478 |     | DATA (BCMOQN(I),I)=181,216,/, |                 |                 |                 | DATA 464 |
| 479 | 501 | =4.3033974E-01,               | =4.1954577E-01, | =3.7796294E-01, | =3.1070101E-01, | DATA 465 |
| 480 | 502 | =2.2532668E-01,               | =1.2968628E-01, | =3.0565100E-02, | =6.4697381E-02, | DATA 466 |
| 481 | 503 | =1.5801692E-01,               | =2.4017483E-01, | =3.1045724E-01, | =3.6643696E-01, | DATA 467 |
| 482 | 504 | =4.0594462E-01,               | =4.2722562E-01, | =4.2921282E-01, | =4.1178142E-01, | DATA 468 |
| 483 | 505 | =3.7584616E-01,               | =3.2324662E-01, | =2.5648419E-01, | =1.7843776E-01, | DATA 469 |
| 484 | 506 | =9.2165882E-02,               | =8.4578301E-04, | =9.2146706E-02, | =1.8304022E-01, | DATA 470 |
| 485 | 507 | =2.6740835E-01,               | =3.3996770E-01, | =3.9466809E-01, | =4.2539590E-01, | DATA 471 |
| 486 | 508 | =4.2743402E-01,               | =3.9918501E-01, | =3.4305854E-01, | =2.6482463E-01, | DATA 472 |
| 487 | 509 | =1.7193054E-01,               | =7.1849112E-02, | =2.8912281E-02, | =1.2512359E-01, | DATA 473 |
| 488 |     | DATA (BCMOQN(I),I)=217,252,/, |                 |                 |                 | DATA 474 |
| 489 | 511 | =2.1271784E-01,               | =2.8850979E-01, | =3.4992846E-01, | =3.9486728E-01, | DATA 475 |
| 490 | 512 | =4.2168824E-01,               | =4.2935283E-01, | =4.1759465E-01, | =3.8702645E-01, | DATA 476 |
| 491 | 513 | =3.3911502E-01,               | =2.7603792E-01, | =2.8049560E-01, | =1.1555430E-01, | DATA 477 |
| 492 | 514 | =2.4562816E-02,               | =6.8849139E-02, | =1.8070220E-01, | =2.4658412E-01, | DATA 478 |
| 493 | 515 | =3.2146324E-01,               | =3.8001760E-01, | =4.1687190E-01, | =4.2765924E-01, | DATA 479 |
| 494 | 516 | =4.1021121E-01,               | =3.6541116E-01, | =2.9712601E-01, | =2.1127581E-01, | DATA 480 |
| 495 | 517 | =1.1462175E-01,               | =1.3786119E-02, | =8.9321435E-02, | =1.7727292E-01, | DATA 481 |
| 496 | 518 | =2.5939635E-01,               | =3.2712635E-01, | =3.7845545E-01, | =4.1162168E-01, | DATA 482 |
| 497 | 519 | =4.2559313E-01,               | =4.2011850E-01, | =3.9573429E-01, | =3.8369473E-01, | DATA 483 |
| 498 |     | DATA (BCMOQN(I),I)=253,288,/, |                 |                 |                 | DATA 484 |
| 499 | 521 | =2.9584710E-01,               | =2.2451104E-01, | =1.4241235E-01, | =5.2687663E-02, | DATA 485 |
| 500 | 522 | =4.1056994E-02,               | =1.3467039E-01, | =2.2341183E-01, | =3.8260420E-01, | DATA 486 |
| 501 | 523 | =3.6488555E-01,               | =4.0676979E-01, | =4.2353384E-01, | =4.1318749E-01, | DATA 487 |
| 502 | 524 | =3.7644015E-01,               | =3.1651377E-01, | =2.3835283E-01, | =1.4770756E-01, | DATA 488 |
| 503 | 525 | =5.0445009E-02,               | =4.7848301E-02, | =1.4206575E-01, | =2.2768517E-01, | DATA 489 |
| 504 | 526 | =3.0084377E-01,               | =3.9841938E-01, | =3.9812914E-01, | =4.1862582E-01, | DATA 490 |
| 505 | 527 | =4.1953893E-01,               | =4.0140842E-01, | =3.4550664E-01, | =3.1361057E-01, | DATA 491 |
| 506 | 528 | =2.4781637E-01,               | =1.7046444E-01, | =8.4195433E-02, | =7.8880833E-03, | DATA 492 |
| 507 | 529 | =1.0200698E-01,               | =1.9352023E-01, | =2.9688636E-01, | =3.4592756E-01, | DATA 493 |
| 508 |     | DATA (BCMOQN(I),I)=289,324,/, |                 |                 |                 | DATA 494 |



|     |                               |                 |                 |                 |                 |          |
|-----|-------------------------------|-----------------|-----------------|-----------------|-----------------|----------|
| 909 | 531                           | 3.9454631E-01,  | 4.1788584E-01,  | 4.1356324E-01,  | 3.8230401E-01,  | DATA 495 |
| 910 | 532                           | 3.2756041E-01,  | 2.5441636E-01,  | 1.0847631E-01,  | 7.5181664E-02,  | DATA 496 |
| 911 | 533                           | -2.0634217E-02, | -1.1374493E-01, | -2.0047107E-01, | -2.2667623E-01, | DATA 497 |
| 912 | 534                           | -3.3888933E-01, | -3.8420961E-01, | -4.1076688E-01, | -4.1771888E-01, | DATA 498 |
| 913 | 535                           | -4.0937235E-01, | -3.7499779E-01, | -3.2848324E-01, | -2.6801776E-01, | DATA 499 |
| 914 | 536                           | -1.9388451E-01, | -1.1443013E-01, | -2.0203698E-02, | 6.5772294E-02,  | DATA 500 |
| 915 | 537                           | 1.5765964E-01,  | 2.4449952E-01,  | 3.2014278E-01,  | 3.7770607E-01,  | DATA 501 |
| 916 | 538                           | 4.1078845E-01,  | 4.1524494E-01,  | 3.9061127E-01,  | 3.4016323E-01,  | DATA 502 |
| 917 | 539                           | 2.6959499E-01,  | 1.8532762E-01,  | 9.8362790E-02,  | -1.1282050E-03, | DATA 503 |
| 918 | DATA (RMOON(I)), I=325,360, / |                 |                 |                 |                 | DATA 504 |
| 919 | 541                           | -9.3739803E-02, | -1.8059657E-01, | -2.9814702E-01, | -3.2309302E-01, | DATA 505 |
| 920 | 542                           | -3.7249664E-01, | -4.0404537E-01, | -4.1637681E-01, | -4.8937146E-01, | DATA 506 |
| 921 | 543                           | -3.8378635E-01, | -3.4168706E-01, | -2.8535511E-01, | -2.1720140E-01, | DATA 507 |
| 922 | 544                           | -1.3995828E-01, | -5.5781866E-02, | 3.2674715E-02,  | 1.2240197E-01,  | DATA 508 |
| 923 | 545                           | 2.0955191E-01,  | 2.8907638E-01,  | 3.9463972E-01,  | 3.9919554E-01,  | DATA 509 |
| 924 | 546                           | 4.1652915E-01,  | 4.0339481E-01,  | 3.6094664E-01,  | 2.9437407E-01,  | DATA 510 |
| 925 | 547                           | 2.1073822E-01,  | 1.1752146E-01,  | 2.1008299E-02,  | -7.3717014E-02, | DATA 511 |
| 926 | 548                           | -1.6260152E-01, | -2.4227707E-01, | -3.0978863E-01, | -3.6249496E-01, | DATA 512 |
| 927 | 549                           | -3.9816814E-01, | -4.1524806E-01, | -4.1312855E-01, | -3.9231114E-01, | DATA 513 |
| 928 | DATA (RMOON(I)), I=361,368, / |                 |                 |                 |                 | DATA 514 |
| 929 | 551                           | -3.5432230E-01, | -3.0142353E-01, | -2.3624991E-01, | -1.6151882E-01, | DATA 515 |
| 930 | 552                           | -7.9888783E-02, | 6.0182706E-03,  | 9.8448413E-02,  | 1.7923171E-01,  | DATA 516 |
| 931 | DATA (RMOON(I)), I=369,361, / |                 |                 |                 |                 | DATA 516 |
| 932 | 561                           | 6.3382675E-01,  | 6.3646485E-01,  | 6.3564017E-01,  | 6.3359992E-01,  | DATA 517 |
| 933 | 562                           | 6.3059383E-01,  | 6.2684186E-01,  | 6.2251190E-01,  | 6.1771149E-01,  | DATA 518 |
| 934 | 563                           | 6.1249581E-01,  | 6.0689085E-01,  | 6.0092875E-01,  | 5.9468978E-01,  | DATA 519 |
| 935 | 564                           | 5.8834291E-01,  | 5.8217374E-01,  | 5.7658822E-01,  | 5.7208358E-01,  | DATA 520 |
| 936 | 565                           | 5.6918392E-01,  | 5.6834759E-01,  | 5.6986648E-01,  | 5.7378663E-01,  | DATA 521 |
| 937 | 566                           | 5.7987663E-01,  | 5.8765440E-01,  | 5.9464620E-01,  | 6.0556420E-01,  | DATA 522 |
| 938 | 567                           | 6.1424328E-01,  | 6.2187487E-01,  | 6.2797679E-01,  | 6.3223387E-01,  | DATA 523 |
| 939 | 568                           | 6.3450293E-01,  | 6.3480292E-01,  | 6.3329412E-01,  | 6.3024898E-01,  | DATA 524 |
| 940 | 569                           | 6.2601604E-01,  | 6.2097909E-01,  | 6.1551461E-01,  | 6.0995259E-01,  | DATA 525 |
| 941 | DATA (RMOON(I)), I=37,72, /   |                 |                 |                 |                 | DATA 526 |
| 942 | 571                           | 6.0454723E-01,  | 5.9946340E-01,  | 5.9478250E-01,  | 5.9052761E-01,  | DATA 527 |
| 943 | 572                           | 5.8470299E-01,  | 5.8333795E-01,  | 5.8052299E-01,  | 5.7842655E-01,  | DATA 528 |
| 944 | 573                           | 5.7728498E-01,  | 5.7736433E-01,  | 5.7890017E-01,  | 5.8203001E-01,  | DATA 529 |
| 945 | 574                           | 5.8673701E-01,  | 5.9282171E-01,  | 5.9990993E-01,  | 6.0749360E-01,  | DATA 530 |
| 946 | 575                           | 6.1499243E-01,  | 6.2182144E-01,  | 6.2745198E-01,  | 6.3145934E-01,  | DATA 531 |
| 947 | 576                           | 6.3355539E-01,  | 6.3360719E-01,  | 6.3164315E-01,  | 6.2784791E-01,  | DATA 532 |
| 948 | 577                           | 6.2254596E-01,  | 6.1617394E-01,  | 6.0924096E-01,  | 6.0227791E-01,  | DATA 533 |
| 949 | 578                           | 5.9378040E-01,  | 5.9015359E-01,  | 5.8567018E-01,  | 5.8245243E-01,  | DATA 534 |
| 950 | 579                           | 5.8648392E-01,  | 5.7964820E-01,  | 5.7978333E-01,  | 5.8073665E-01,  | DATA 535 |
| 951 | DATA (RMOON(I)), I=73,108, /  |                 |                 |                 |                 | DATA 536 |
| 952 | 581                           | 5.8240454E-01,  | 5.8474803E-01,  | 5.8778173E-01,  | 5.9154149E-01,  | DATA 537 |
| 953 | 582                           | 5.9604043E-01,  | 6.0122628E-01,  | 6.0695130E-01,  | 6.1296264E-01,  | DATA 538 |
| 954 | 583                           | 6.1891438E-01,  | 6.2439766E-01,  | 6.2898190E-01,  | 6.3225968E-01,  | DATA 539 |
| 955 | 584                           | 6.3388936E-01,  | 6.3363171E-01,  | 6.3137884E-01,  | 6.2717445E-01,  | DATA 540 |
| 956 | 585                           | 6.2422437E-01,  | 6.1389479E-01,  | 6.0569517E-01,  | 5.9724237E-01,  | DATA 541 |
| 957 | 586                           | 5.8920413E-01,  | 5.8222421E-01,  | 5.7683870E-01,  | 5.7340121E-01,  | DATA 542 |
| 958 | 587                           | 5.7203833E-01,  | 5.7265016E-01,  | 5.7495636E-01,  | 5.7857262E-01,  | DATA 543 |
| 959 | 588                           | 5.8309351E-01,  | 5.8819979E-01,  | 5.9349751E-01,  | 5.9892651E-01,  | DATA 544 |
| 960 | 589                           | 6.0434345E-01,  | 6.0968874E-01,  | 6.1490801E-01,  | 6.1991796E-01,  | DATA 545 |
| 961 | DATA (RMOON(I)), I=109,144, / |                 |                 |                 |                 | DATA 546 |
| 962 | 591                           | 6.2458312E-01,  | 6.2870761E-01,  | 6.3204253E-01,  | 6.3430707E-01,  | DATA 547 |
| 963 | 592                           | 6.3521895E-01,  | 6.3453043E-01,  | 6.3206515E-01,  | 6.2775314E-01,  | DATA 548 |
| 964 | 593                           | 6.2166127E-01,  | 6.1401631E-01,  | 6.0521609E-01,  | 5.9582244E-01,  | DATA 549 |
| 965 | 594                           | 5.8652940E-01,  | 5.7810187E-01,  | 5.7128424E-01,  | 5.668982E-01,   | DATA 550 |
| 966 | 595                           | 5.6469684E-01,  | 5.6538417E-01,  | 5.6893039E-01,  | 5.7367672E-01,  | DATA 551 |
| 967 | 596                           | 5.8023064E-01,  | 5.8757603E-01,  | 5.9516179E-01,  | 6.0255478E-01,  | DATA 552 |
| 968 | 597                           | 6.0945643E-01,  | 6.1569060E-01,  | 6.2117340E-01,  | 6.2587550E-01,  | DATA 553 |
| 969 | 598                           | 6.2978446E-01,  | 6.3287245E-01,  | 6.3507921E-01,  | 6.3628492E-01,  | DATA 554 |
| 970 | 599                           | 6.3635703E-01,  | 6.3512868E-01,  | 6.3244673E-01,  | 6.2820302E-01,  | DATA 555 |
| 971 | DATA (RMOON(I)), I=145,180, / |                 |                 |                 |                 | DATA 556 |
| 972 | 601                           | 6.2237219E-01,  | 6.1504804E-01,  | 6.0647438E-01,  | 5.9706561E-01,  | DATA 557 |
| 973 | 602                           | 5.8740450E-01,  | 5.7821446E-01,  | 5.7029210E-01,  | 5.6440340E-01,  | DATA 558 |
| 974 | 603                           | 5.6115602E-01,  | 5.6088111E-01,  | 5.6356513E-01,  | 5.6885820E-01,  | DATA 559 |
| 975 | 604                           | 5.7615539E-01,  | 5.8471981E-01,  | 5.9380712E-01,  | 6.0276158E-01,  | DATA 560 |
| 976 | 605                           | 6.1107174E-01,  | 6.1838833E-01,  | 6.2451339E-01,  | 6.2937232E-01,  | DATA 561 |
| 977 | 606                           | 6.3297748E-01,  | 6.3538927E-01,  | 6.3667936E-01,  | 6.3690208E-01,  | DATA 562 |
| 978 | 607                           | 6.3607771E-01,  | 6.3418803E-01,  | 6.3118378E-01,  | 6.2700483E-01,  | DATA 563 |
| 979 | 608                           | 6.2161147E-01,  | 6.1502208E-01,  | 6.0735150E-01,  | 5.9884571E-01,  | DATA 564 |
| 980 | 609                           | 5.8990530E-01,  | 5.8108792E-01,  | 5.7307791E-01,  | 5.6661672E-01,  | DATA 565 |
| 981 | DATA (RMOON(I)), I=181,216, / |                 |                 |                 |                 | DATA 566 |

|     |                             |            |     |            |     |            |     |            |     |      |      |     |
|-----|-----------------------------|------------|-----|------------|-----|------------|-----|------------|-----|------|------|-----|
| 982 | 611                         | 5.6239944E | 01, | 5.6092793E | 01, | 5.6243933E | 01, | 5.6681084E | 01, | DATA | 567  |     |
| 983 | 612                         | 5.7359839E | 01, | 5.8212396E | 01, | 5.9159884E | 01, | 6.8124434E | 01, | DATA | 568  |     |
| 984 | 613                         | 6.1038231E | 01, | 6.1848786E | 01, | 6.2920790E | 01, | 6.3033399E | 01, | DATA | 569  |     |
| 985 | 614                         | 6.3387911E | 01, | 6.3584527E | 01, | 6.4638665E | 01, | 6.8567208E | 01, | DATA | 570  |     |
| 986 | 615                         | 6.3387177E | 01, | 6.3113198E | 01, | 6.2755965E | 01, | 6.2321907E | 01, | DATA | 571  |     |
| 987 | 616                         | 6.1814281E | 01, | 6.1233597E | 01, | 6.8590986E | 01, | 5.9891963E | 01, | DATA | 572  |     |
| 988 | 617                         | 5.2159967E | 01, | 5.8428831E | 01, | 5.7745036E | 01, | 5.7164817E | 01, | DATA | 573  |     |
| 989 | 618                         | 5.674731E  | 01, | 5.6546539E | 01, | 5.6597435E | 01, | 5.6910216E | 01, | DATA | 574  |     |
| 990 | 619                         | 5.7464033E | 01, | 5.8214526E | 01, | 5.9092513E | 01, | 6.8023917E | 01, | DATA | 575  |     |
| 991 | DATA (RMOON (I),I=217,252,) |            |     |            |     |            |     |            |     |      | DATA | 576 |
| 992 | 621                         | 6.0935333E | 01, | 6.1762816E | 01, | 6.2456833E | 01, | 6.2984420E | 01, | DATA | 577  |     |
| 993 | 622                         | 6.3329218E | 01, | 6.3489991E | 01, | 6.8478133E | 01, | 6.8314633E | 01, | DATA | 578  |     |
| 994 | 623                         | 6.3026326E | 01, | 6.2642421E | 01, | 6.2190977E | 01, | 6.1696137E | 01, | DATA | 579  |     |
| 995 | 624                         | 6.1176422E | 01, | 6.0644433E | 01, | 6.8108124E | 01, | 5.9573456E | 01, | DATA | 580  |     |
| 996 | 625                         | 5.9047939E | 01, | 5.8544279E | 01, | 5.8083100E | 01, | 5.2693713E | 01, | DATA | 581  |     |
| 997 | 626                         | 5.7412161E | 01, | 5.7276295E | 01, | 5.7318561E | 01, | 5.7558125E | 01, | DATA | 582  |     |
| 998 | 627                         | 5.7994619E | 01, | 5.8605518E | 01, | 5.9347987E | 01, | 6.8164818E | 01, | DATA | 583  |     |
| 999 | 628                         | 6.0990623E | 01, | 6.1762646E | 01, | 6.2424329E | 01, | 6.2931481E | 01, | DATA | 584  |     |
| 600 | 629                         | 6.3254726E | 01, | 6.3380580E | 01, | 6.3311176E | 01, | 6.8062923E | 01, | DATA | 585  |     |
| 601 | DATA (RMOON (I),I=253,288,) |            |     |            |     |            |     |            |     |      | DATA | 586 |
| 602 | 631                         | 6.2664230E | 01, | 6.2152375E | 01, | 6.1569647E | 01, | 6.8958990E | 01, | DATA | 587  |     |
| 603 | 632                         | 6.0359608E | 01, | 5.9803187E | 01, | 5.9311486E | 01, | 5.8895888E | 01, | DATA | 588  |     |
| 604 | 633                         | 5.8559117E | 01, | 5.8298729E | 01, | 5.8111444E | 01, | 5.7997103E | 01, | DATA | 589  |     |
| 605 | 634                         | 5.7961067E | 01, | 5.8014259E | 01, | 5.8170666E | 01, | 5.8442842E | 01, | DATA | 590  |     |
| 606 | 635                         | 5.8836597E | 01, | 5.9346401E | 01, | 5.9952833E | 01, | 6.8622755E | 01, | DATA | 591  |     |
| 607 | 636                         | 6.1312125E | 01, | 6.1970659E | 01, | 6.2547279E | 01, | 6.2995396E | 01, | DATA | 592  |     |
| 608 | 637                         | 6.3277339E | 01, | 6.3367707E | 01, | 6.3255605E | 01, | 6.2945787E | 01, | DATA | 593  |     |
| 609 | 638                         | 6.2458726E | 01, | 6.1829535E | 01, | 6.1105568E | 01, | 6.9342567E | 01, | DATA | 594  |     |
| 610 | 639                         | 5.9599319E | 01, | 5.8931214E | 01, | 5.8383631E | 01, | 5.7986848E | 01, | DATA | 595  |     |
| 611 | DATA (RMOON (I),I=289,324,) |            |     |            |     |            |     |            |     |      | DATA | 596 |
| 612 | 641                         | 5.7751815E | 01, | 5.7673930E | 01, | 5.7734177E | 01, | 5.7906870E | 01, | DATA | 597  |     |
| 613 | 642                         | 5.8165890E | 01, | 5.8489773E | 01, | 5.8864282E | 01, | 5.9282209E | 01, | DATA | 598  |     |
| 614 | 643                         | 5.9740847E | 01, | 6.0238071E | 01, | 6.0768232E | 01, | 6.1318924E | 01, | DATA | 599  |     |
| 615 | 644                         | 6.1869399E | 01, | 6.2390837E | 01, | 6.2848633E | 01, | 6.3205348E | 01, | DATA | 600  |     |
| 616 | 645                         | 6.3425005E | 01, | 6.3477127E | 01, | 6.3340467E | 01, | 6.3006263E | 01, | DATA | 601  |     |
| 617 | 646                         | 6.2480758E | 01, | 6.1786006E | 01, | 6.0964215E | 01, | 6.8068389E | 01, | DATA | 602  |     |
| 618 | 647                         | 5.9166734E | 01, | 5.8332474E | 01, | 5.7636049E | 01, | 5.7135246E | 01, | DATA | 603  |     |
| 619 | 648                         | 5.6866262E | 01, | 5.6838388E | 01, | 5.7034179E | 01, | 5.7415139E | 01, | DATA | 604  |     |
| 620 | 649                         | 5.7931016E | 01, | 5.8529715E | 01, | 5.9165277E | 01, | 5.9802602E | 01, | DATA | 605  |     |
| 621 | DATA (RMOON (I),I=325,360,) |            |     |            |     |            |     |            |     |      | DATA | 606 |
| 622 | 651                         | 6.0418695E | 01, | 6.1001047E | 01, | 6.1544118E | 01, | 6.2045158E | 01, | DATA | 607  |     |
| 623 | 652                         | 6.2900309E | 01, | 6.2901660E | 01, | 6.3235672E | 01, | 6.3483176E | 01, | DATA | 608  |     |
| 624 | 653                         | 6.3620904E | 01, | 6.3624180E | 01, | 6.3470413E | 01, | 6.3142983E | 01, | DATA | 609  |     |
| 625 | 654                         | 6.2635181E | 01, | 6.1953797E | 01, | 6.1122031E | 01, | 6.8181196E | 01, | DATA | 610  |     |
| 626 | 655                         | 5.9190475E | 01, | 5.8223888E | 01, | 5.7363704E | 01, | 5.6690184E | 01, | DATA | 611  |     |
| 627 | 656                         | 5.6268925E | 01, | 5.6138828E | 01, | 5.6304677E | 01, | 5.6737113E | 01, | DATA | 612  |     |
| 628 | 657                         | 5.7380108E | 01, | 5.8163131E | 01, | 5.9013926E | 01, | 5.9868886E | 01, | DATA | 613  |     |
| 629 | 658                         | 6.0677523E | 01, | 6.1407394E | 01, | 6.2039883E | 01, | 6.2568344E | 01, | DATA | 614  |     |
| 630 | 659                         | 6.2993872E | 01, | 6.3320873E | 01, | 6.3553354E | 01, | 6.8692011E | 01, | DATA | 615  |     |
| 631 | DATA (RMOON (I),I=361,368,) |            |     |            |     |            |     |            |     |      | DATA | 616 |
| 632 | 661                         | 6.3732701E | 01, | 6.3666407E | 01, | 6.3480575E | 01, | 6.8161719E | 01, | DATA | 617  |     |
| 633 | 662                         | 6.2699014E | 01, | 6.2088429E | 01, | 6.1336888E | 01, | 6.8468013E | 01, | DATA | 618  |     |
| 634 | END                         |            |     |            |     |            |     |            |     |      | DATA | 619 |

29748 WORDS OF MEMORY USED BY THIS COMPILATION

71084 02 11-03-72 11.636 1973 EPHMERIS

## PREFACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

## PRIMARY SYMDEF ENTRY

TABLE 0

## SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1 ERMOLK

11

SVHREF

END OF BINARY CARD \*1973\*19

4273 IS THE NEXT AVAILABLE LOCATION.

GMAP VERSION/ASSEMBLY DATES JHRA 110171/102971

JMPB 110171/102971

JMPC 110171/102971

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

\*\* 19411 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

71084 02 11-03-72 11.630 1974 EPHEMERIS

| 1  | C*1974* | 1974 EPHEMERIS                                                   | DATA | 1  |
|----|---------|------------------------------------------------------------------|------|----|
| 2  |         | SUBROUTINE TABLE                                                 | DATA | 2  |
| 3  |         | DIMENSION RASUN (369), DCSUN (369), RSUN (369)                   | DATA | 3  |
| 4  |         | DIMENSION RAMOON (369), DCMOON (369), RMOON (369)                | DATA | 4  |
| 5  |         | DIMENSION ARRAY (2214)                                           |      |    |
| 6  |         | DOUBLE PRECISION Y                                               |      |    |
| 7  |         | EQUIVALENCE (RASUN,ARRAY), (DCSUN,ARRAY(370)), (RSUN,ARRAY(739)) |      |    |
| 8  |         | EQUIVALENCE (RAMOON,ARRAY(1105)), (DCMOON,ARRAY(1477))           |      |    |
| 9  |         | EQUIVALENCE (RMOON,ARRAY(1849))                                  |      |    |
| 10 |         | COMMON /EPHOLK/ V(4), I                                          |      |    |
| 11 |         | Y(1) = ARRAY(I)                                                  |      |    |
| 12 |         | Y(2) = ARRAY(I+1)                                                |      |    |
| 13 |         | Y(3) = ARRAY(I+2)                                                |      |    |
| 14 |         | Y(4) = ARRAY(I+3)                                                |      |    |
| 15 |         | RETURN                                                           |      |    |
| 16 |         | DATA (RASUN (I), I = 1, 369)/                                    | DATA | 6  |
| 17 | 11      | 4.8865044E 00, 4.9057931E 00, 4.9250585E 00, 4.9442984E 00,      | DATA | 7  |
| 18 | 12      | 4.9635108E 00, 4.9826937E 00, 5.0018446E 00, 5.0209623E 00,      | DATA | 8  |
| 19 | 13      | 5.0400447E 00, 5.0590903E 00, 5.0780975E 00, 5.0970646E 00,      | DATA | 9  |
| 20 | 14      | 5.1159905E 00, 5.1348737E 00, 5.1537133E 00, 5.1725078E 00,      | DATA | 10 |
| 21 | 15      | 5.1912557E 00, 5.2099559E 00, 5.2286069E 00, 5.2472074E 00,      | DATA | 11 |
| 22 | 16      | 5.2657561E 00, 5.2842516E 00, 5.3026928E 00, 5.3210785E 00,      | DATA | 12 |
| 23 | 17      | 5.3394079E 00, 5.3576798E 00, 5.3758936E 00, 5.3940485E 00,      | DATA | 13 |
| 24 | 18      | 5.4121438E 00, 5.4301792E 00, 5.4481542E 00, 5.4660687E 00,      | DATA | 14 |
| 25 | 19      | 5.4839226E 00, 5.5017158E 00, 5.5194482E 00, 5.5371200E 00,      | DATA | 15 |
| 26 |         | DATA (RASUN (I), I = 37, 72)/                                    | DATA | 16 |
| 27 | 21      | 5.5547316E 00, 5.5722835E 00, 5.5897760E 00, 5.6072100E 00,      | DATA | 17 |
| 28 | 22      | 5.6245862E 00, 5.6419057E 00, 5.6591695E 00, 5.6763784E 00,      | DATA | 18 |
| 29 | 23      | 5.6933532E 00, 5.7106346E 00, 5.7276835E 00, 5.7446806E 00,      | DATA | 19 |
| 30 | 24      | 5.7616265E 00, 5.7785219E 00, 5.7953677E 00, 5.8121645E 00,      | DATA | 20 |
| 31 | 25      | 5.8289133E 00, 5.8456149E 00, 5.8622701E 00, 5.8788799E 00,      | DATA | 21 |
| 32 | 26      | 5.8954453E 00, 5.9119673E 00, 5.9284471E 00, 5.9448857E 00,      | DATA | 22 |
| 33 | 27      | 5.9612843E 00, 5.9776440E 00, 5.9939639E 00, 6.0102513E 00,      | DATA | 23 |
| 34 | 28      | 6.0265018E 00, 6.0427187E 00, 6.0589035E 00, 6.0750579E 00,      | DATA | 24 |
| 35 | 29      | 6.0911840E 00, 6.1072834E 00, 6.1233583E 00, 6.1394103E 00,      | DATA | 25 |
| 36 |         | DATA (RASUN (I), I = 73, 108)/                                   | DATA | 26 |
| 37 | 31      | 6.1554410E 00, 6.1714520E 00, 6.1874430E 00, 6.2034213E 00,      | DATA | 27 |
| 38 | 32      | 6.2193823E 00, 6.2353296E 00, 6.2512643E 00, 6.2671881E 00,      | DATA | 28 |
| 39 | 33      | 6.2831020E 00, 1.5822198E-02, 3.1720731E-02, 4.7613487E-02,      | DATA | 29 |
| 40 | 34      | 6.3301772E-02, 7.9386873E-02, 9.5270078E-02, 1.1115259E-01,      | DATA | 30 |
| 41 | 35      | 1.2703563E-01, 1.4292034E-01, 1.5880775E-01, 1.7469929E-01,      | DATA | 31 |
| 42 | 36      | 1.9059630E-01, 2.0650022E-01, 2.2241241E-01, 2.3833474E-01,      | DATA | 32 |
| 43 | 37      | 2.5426888E-01, 2.7021664E-01, 2.8617973E-01, 3.0215972E-01,      | DATA | 33 |
| 44 | 38      | 3.1815809E-01, 3.3417635E-01, 3.5021592E-01, 3.6627800E-01,      | DATA | 34 |
| 45 | 39      | 3.8236381E-01, 3.9847452E-01, 4.1461133E-01, 4.3077523E-01,      | DATA | 35 |
| 46 |         | DATA (RASUN (I), I = 109, 144)/                                  | DATA | 36 |
| 47 | 41      | 4.4696732E-01, 4.6318854E-01, 4.7943997E-01, 4.9572237E-01,      | DATA | 37 |
| 48 | 42      | 5.1203650E-01, 5.2838312E-01, 5.4476289E-01, 5.6117629E-01,      | DATA | 38 |
| 49 | 43      | 5.7762380E-01, 5.9410571E-01, 6.1062231E-01, 6.2717421E-01,      | DATA | 39 |
| 50 | 44      | 6.4376195E-01, 6.6038616E-01, 6.7704735E-01, 6.9374448E-01,      | DATA | 40 |
| 51 | 45      | 7.1048438E-01, 7.2726180E-01, 7.4407947E-01, 7.6093798E-01,      | DATA | 41 |
| 52 | 46      | 7.7783784E-01, 7.9477949E-01, 8.1176342E-01, 8.2878973E-01,      | DATA | 42 |
| 53 | 47      | 8.4585843E-01, 8.6297027E-01, 8.8012467E-01, 8.9732178E-01,      | DATA | 43 |
| 54 | 48      | 9.1456149E-01, 9.3184362E-01, 9.4916798E-01, 9.6653406E-01,      | DATA | 44 |
| 55 | 49      | 9.8394134E-01, 1.0013892E 00, 1.0198876E 00, 1.0384403E 00,      | DATA | 45 |
| 56 |         | DATA (RASUN (I), I = 145, 180)/                                  | DATA | 46 |
| 57 | 51      | 1.0539673E 00, 1.0715578E 00, 1.0892034E 00, 1.1068731E 00,      | DATA | 47 |
| 58 | 52      | 1.1245759E 00, 1.1423108E 00, 1.1600768E 00, 1.1778733E 00,      | DATA | 48 |
| 59 | 53      | 1.1956994E 00, 1.2135542E 00, 1.2314370E 00, 1.2493465E 00,      | DATA | 49 |
| 60 | 54      | 1.2672818E 00, 1.2852418E 00, 1.3032254E 00, 1.3212312E 00,      | DATA | 50 |
| 61 | 55      | 1.3392581E 00, 1.3573047E 00, 1.3753696E 00, 1.3934516E 00,      | DATA | 51 |



|     |                               |                 |                 |                 |                 |      |     |
|-----|-------------------------------|-----------------|-----------------|-----------------|-----------------|------|-----|
| 62  | 56                            | 1.4115490E 00,  | 1.4296603E 00,  | 1.4477846E 00,  | 1.4659196E 00,  | DATA | 92  |
| 63  | 57                            | 1.4840636E 00,  | 1.50222149E 00, | 1.5203718E 00,  | 1.5385318E 00,  | DATA | 93  |
| 64  | 58                            | 1.5266926E 00,  | 1.5748521E 00,  | 1.5930079E 00,  | 1.6111880E 00,  | DATA | 94  |
| 65  | 59                            | 1.6293009E 00,  | 1.6474337E 00,  | 1.6655556E 00,  | 1.6836649E 00,  | DATA | 95  |
| 66  | DATA (RASUN I), I=181, 216, / |                 |                 |                 |                 | DATA | 96  |
| 67  | 61                            | 1.7017600E 00,  | 1.7198397E 00,  | 1.7379023E 00,  | 1.7559465E 00,  | DATA | 97  |
| 68  | 62                            | 1.7739708E 00,  | 1.7919740E 00,  | 1.8099347E 00,  | 1.8279118E 00,  | DATA | 98  |
| 69  | 63                            | 1.8458439E 00,  | 1.8637499E 00,  | 1.8816287E 00,  | 1.8994792E 00,  | DATA | 99  |
| 70  | 64                            | 1.9173003E 00,  | 1.9350912E 00,  | 1.9528308E 00,  | 1.9705780E 00,  | DATA | 100 |
| 71  | 65                            | 1.9882720E 00,  | 2.0059313E 00,  | 2.0235537E 00,  | 2.0411431E 00,  | DATA | 101 |
| 72  | 66                            | 2.0286923E 00,  | 2.0762020E 00,  | 2.0936712E 00,  | 2.110987E 00,   | DATA | 102 |
| 73  | 67                            | 2.1284838E 00,  | 2.1458258E 00,  | 2.1631239E 00,  | 2.1803778E 00,  | DATA | 103 |
| 74  | 68                            | 2.1975874E 00,  | 2.2147524E 00,  | 2.2318723E 00,  | 2.2489477E 00,  | DATA | 104 |
| 75  | 69                            | 2.2659779E 00,  | 2.2829631E 00,  | 2.2999037E 00,  | 2.3167997E 00,  | DATA | 105 |
| 76  | DATA (RASUN I), I=217, 252, / |                 |                 |                 |                 | DATA | 106 |
| 77  | 71                            | 2.3336515E 00,  | 2.3504593E 00,  | 2.3672241E 00,  | 2.3839457E 00,  | DATA | 107 |
| 78  | 72                            | 2.4006251E 00,  | 2.4172626E 00,  | 2.4338592E 00,  | 2.4504152E 00,  | DATA | 108 |
| 79  | 73                            | 2.4669313E 00,  | 2.4834080E 00,  | 2.4998461E 00,  | 2.5162455E 00,  | DATA | 109 |
| 80  | 74                            | 2.5326066E 00,  | 2.5489297E 00,  | 2.5652153E 00,  | 2.5814639E 00,  | DATA | 110 |
| 81  | 75                            | 2.5976759E 00,  | 2.6138520E 00,  | 2.6299928E 00,  | 2.6460993E 00,  | DATA | 111 |
| 82  | 76                            | 2.6621724E 00,  | 2.6782131E 00,  | 2.6942222E 00,  | 2.7102008E 00,  | DATA | 112 |
| 83  | 77                            | 2.7261900E 00,  | 2.7420711E 00,  | 2.7579653E 00,  | 2.7738338E 00,  | DATA | 113 |
| 84  | 78                            | 2.7896783E 00,  | 2.8055000E 00,  | 2.8213004E 00,  | 2.8370811E 00,  | DATA | 114 |
| 85  | 79                            | 2.8528436E 00,  | 2.8685896E 00,  | 2.8843203E 00,  | 2.9000380E 00,  | DATA | 115 |
| 86  | DATA (RASUN I), I=253, 288, / |                 |                 |                 |                 | DATA | 116 |
| 87  | 81                            | 2.9157435E 00,  | 2.9314384E 00,  | 2.9471243E 00,  | 2.9628021E 00,  | DATA | 117 |
| 88  | 82                            | 2.9784729E 00,  | 2.9941381E 00,  | 3.0097959E 00,  | 3.0254564E 00,  | DATA | 118 |
| 89  | 83                            | 3.0411119E 00,  | 3.0567664E 00,  | 3.0724211E 00,  | 3.0880775E 00,  | DATA | 119 |
| 90  | 84                            | 3.1037368E 00,  | 3.1194003E 00,  | 3.1350691E 00,  | 3.1507449E 00,  | DATA | 120 |
| 91  | 85                            | 3.1664290E 00,  | 3.1821229E 00,  | 3.1978282E 00,  | 3.2135465E 00,  | DATA | 121 |
| 92  | 86                            | 3.2292796E 00,  | 3.2450290E 00,  | 3.2607965E 00,  | 3.2765840E 00,  | DATA | 122 |
| 93  | 87                            | 3.2923931E 00,  | 3.3082238E 00,  | 3.3240837E 00,  | 3.3399686E 00,  | DATA | 123 |
| 94  | 88                            | 3.3558820E 00,  | 3.3718253E 00,  | 3.3878088E 00,  | 3.4038089E 00,  | DATA | 124 |
| 95  | 89                            | 3.4198912E 00,  | 3.4359290E 00,  | 3.4520439E 00,  | 3.4681967E 00,  | DATA | 125 |
| 96  | DATA (RASUN I), I=289, 324, / |                 |                 |                 |                 | DATA | 126 |
| 97  | 91                            | 3.4943886E 00,  | 3.5006208E 00,  | 3.5168941E 00,  | 3.5332097E 00,  | DATA | 127 |
| 98  | 92                            | 3.5495684E 00,  | 3.5659713E 00,  | 3.5824190E 00,  | 3.5989127E 00,  | DATA | 128 |
| 99  | 93                            | 3.6154935E 00,  | 3.6320423E 00,  | 3.6486802E 00,  | 3.6653683E 00,  | DATA | 129 |
| 100 | 94                            | 3.6821078E 00,  | 3.6988998E 00,  | 3.7157454E 00,  | 3.7326458E 00,  | DATA | 130 |
| 101 | 95                            | 3.7496021E 00,  | 3.7666153E 00,  | 3.7836868E 00,  | 3.8008172E 00,  | DATA | 131 |
| 102 | 96                            | 3.8180073E 00,  | 3.8352581E 00,  | 3.8525701E 00,  | 3.8699438E 00,  | DATA | 132 |
| 103 | 97                            | 3.8873796E 00,  | 3.9048778E 00,  | 3.9224390E 00,  | 3.9400631E 00,  | DATA | 133 |
| 104 | 98                            | 3.9577500E 00,  | 3.9754995E 00,  | 3.9933115E 00,  | 4.0111853E 00,  | DATA | 134 |
| 105 | 99                            | 4.0291206E 00,  | 4.0471166E 00,  | 4.0651726E 00,  | 4.0832881E 00,  | DATA | 135 |
| 106 | DATA (RASUN I), I=325, 360, / |                 |                 |                 |                 | DATA | 136 |
| 107 | 101                           | 4.1014622E 00,  | 4.1196946E 00,  | 4.1379842E 00,  | 4.1563305E 00,  | DATA | 137 |
| 108 | 102                           | 4.1747326E 00,  | 4.1931899E 00,  | 4.2117015E 00,  | 4.2302665E 00,  | DATA | 138 |
| 109 | 103                           | 4.2488842E 00,  | 4.2675537E 00,  | 4.2862737E 00,  | 4.3050433E 00,  | DATA | 139 |
| 110 | 104                           | 4.3238614E 00,  | 4.3427264E 00,  | 4.3616373E 00,  | 4.3805923E 00,  | DATA | 140 |
| 111 | 105                           | 4.3995899E 00,  | 4.4186284E 00,  | 4.4377706E 00,  | 4.4569211E 00,  | DATA | 141 |
| 112 | 106                           | 4.4759712E 00,  | 4.4951539E 00,  | 4.5143670E 00,  | 4.5336079E 00,  | DATA | 142 |
| 113 | 107                           | 4.5528738E 00,  | 4.5721623E 00,  | 4.5914704E 00,  | 4.6107956E 00,  | DATA | 143 |
| 114 | 108                           | 4.6301331E 00,  | 4.6494865E 00,  | 4.6688847E 00,  | 4.6882144E 00,  | DATA | 144 |
| 115 | 109                           | 4.7075858E 00,  | 4.7269589E 00,  | 4.7463313E 00,  | 4.7657006E 00,  | DATA | 145 |
| 116 | DATA (RASUN I), I=361, 368, / |                 |                 |                 |                 | DATA | 146 |
| 117 | 111                           | 4.7850646E 00,  | 4.8044210E 00,  | 4.8237673E 00,  | 4.8431015E 00,  | DATA | 147 |
| 118 | 112                           | 4.8624215E 00,  | 4.8817250E 00,  | 4.9010103E 00,  | 4.9202750E 00,  | DATA | 148 |
| 119 | DATA (BCSUN I), I=1, 36, /    |                 |                 |                 |                 | DATA | 149 |
| 120 | 121                           | -4.0361568E-01, | -4.0232236E-01, | -4.0089529E-01, | -3.9933519E-01, | DATA | 150 |
| 121 | 122                           | -3.9764287E-01, | -3.9581921E-01, | -3.9386520E-01, | -3.9178172E-01, | DATA | 151 |
| 122 | 123                           | -3.8956977E-01, | -3.8723033E-01, | -3.8476444E-01, | -3.8217314E-01, | DATA | 152 |
| 123 | 124                           | -3.7945759E-01, | -3.7641894E-01, | -3.7365839E-01, | -3.7057739E-01, | DATA | 153 |
| 124 | 125                           | -3.6737736E-01, | -3.6405981E-01, | -3.6062637E-01, | -3.5707866E-01, | DATA | 154 |
| 125 | 126                           | -3.5341832E-01, | -3.4964713E-01, | -3.4576682E-01, | -3.4177915E-01, | DATA | 155 |
| 126 | 127                           | -3.3768988E-01, | -3.3346912E-01, | -3.2919047E-01, | -3.2479196E-01, | DATA | 156 |
| 127 | 128                           | -3.2029542E-01, | -3.1570282E-01, | -3.1101612E-01, | -3.0623726E-01, | DATA | 157 |
| 128 | 129                           | -3.0136823E-01, | -2.9641100E-01, | -2.9136764E-01, | -2.8624004E-01, | DATA | 158 |
| 129 | DATA (BCSUN I), I=37, 72, /   |                 |                 |                 |                 | DATA | 159 |
| 130 | 131                           | -2.8103010E-01, | -2.7573974E-01, | -2.7037078E-01, | -2.6492511E-01, | DATA | 160 |
| 131 | 132                           | -2.5940457E-01, | -2.5381097E-01, | -2.4814609E-01, | -2.4241203E-01, | DATA | 161 |
| 132 | 133                           | -2.3651070E-01, | -2.3074421E-01, | -2.2481455E-01, | -2.1882384E-01, | DATA | 162 |
| 133 | 134                           | -2.1277416E-01, | -2.0666755E-01, | -2.0050061E-01, | -1.9429203E-01, | DATA | 163 |
| 134 | 135                           | -1.8802724E-01, | -1.8171392E-01, | -1.7535411E-01, | -1.6894983E-01, | DATA | 164 |
| 135 | 136                           | -1.6250320E-01, | -1.5601627E-01, | -1.4949093E-01, | -1.4292935E-01, | DATA | 165 |

|     |     |                              |                 |                 |                 |      |     |
|-----|-----|------------------------------|-----------------|-----------------|-----------------|------|-----|
| 136 | 137 | -1.3633344E-01,              | -1.2970518E-01, | -1.2304663E-01, | -1.4635961E-01, | DATA | 125 |
| 137 | 138 | -1.0964598E-01,              | -1.0290754E-01, | -9.6146110E-02, | -8.9363354E-02, | DATA | 126 |
| 138 | 139 | -8.2860958E-02,              | -7.5740587E-02, | -6.8903830E-02, | -6.2052559E-02, | DATA | 127 |
| 139 |     | DATA (BCSUN (I), I=73,108)/  |                 |                 |                 | DATA | 128 |
| 140 | 141 | -5.5188483E-02,              | -4.8313415E-02, | -4.1429139E-02, | -3.4537521E-02, | DATA | 129 |
| 141 | 142 | -2.7640413E-02,              | -2.0739669E-02, | -1.5837130E-02, | -6.9346556E-03, | DATA | 130 |
| 142 | 143 | -3.4098163E-03,              | 6.8626997E-03,  | 1.5753931E-02,  | 2.8637729E-02,  | DATA | 131 |
| 143 | 144 | -2.7512274E-02,              | 4.4375756E-02,  | 4.1226368E-02,  | 4.8062330E-02,  | DATA | 132 |
| 144 | 145 | 5.4881897E-02,               | 6.1683169E-02,  | 6.8464429E-02,  | 7.5223996E-02,  | DATA | 133 |
| 145 | 146 | 8.1960191E-02,               | 8.8671374E-02,  | 9.5359902E-02,  | 1.0261228E-01,  | DATA | 134 |
| 146 | 147 | 1.0863899E-01,               | 1.1523454E-01,  | 1.2179749E-01,  | 1.2832613E-01,  | DATA | 135 |
| 147 | 148 | 1.3481901E-01,               | 1.4127450E-01,  | 1.4769099E-01,  | 1.5406680E-01,  | DATA | 136 |
| 148 | 149 | 1.6040020E-01,               | 1.6668973E-01,  | 1.7293348E-01,  | 1.7912989E-01,  | DATA | 137 |
| 149 |     | DATA (BCSUN (I), I=109,144)/ |                 |                 |                 | DATA | 138 |
| 150 | 151 | 1.8527715E-01,               | 1.9137366E-01,  | 1.9741778E-01,  | 2.0340778E-01,  | DATA | 139 |
| 151 | 152 | 2.0934199E-01,               | 2.1521875E-01,  | 2.2103642E-01,  | 2.2679337E-01,  | DATA | 140 |
| 152 | 153 | 2.3248790E-01,               | 2.3811837E-01,  | 2.4368312E-01,  | 2.4918059E-01,  | DATA | 141 |
| 153 | 154 | 2.5460919E-01,               | 2.5996738E-01,  | 2.6525367E-01,  | 2.7046659E-01,  | DATA | 142 |
| 154 | 155 | 2.7560481E-01,               | 2.8066691E-01,  | 2.8565148E-01,  | 2.9055713E-01,  | DATA | 143 |
| 155 | 156 | 2.9382426E-01,               | 3.0012597E-01,  | 3.0478632E-01,  | 3.0936205E-01,  | DATA | 144 |
| 156 | 157 | 3.1385166E-01,               | 3.1825373E-01,  | 3.2256685E-01,  | 3.2678958E-01,  | DATA | 145 |
| 157 | 158 | 3.3092050E-01,               | 3.3495823E-01,  | 3.3890146E-01,  | 3.4274882E-01,  | DATA | 146 |
| 158 | 159 | 3.4649901E-01,               | 3.5015078E-01,  | 3.5370288E-01,  | 3.5715413E-01,  | DATA | 147 |
| 159 |     | DATA (BCSUN (I), I=145,180)/ |                 |                 |                 | DATA | 148 |
| 160 | 161 | 3.6050332E-01,               | 3.6374918E-01,  | 3.6689064E-01,  | 3.6992649E-01,  | DATA | 149 |
| 161 | 162 | 3.7285572E-01,               | 3.7567727E-01,  | 3.7839016E-01,  | 3.8099355E-01,  | DATA | 150 |
| 162 | 163 | 3.8348648E-01,               | 3.8586823E-01,  | 3.8813797E-01,  | 3.9029495E-01,  | DATA | 151 |
| 163 | 164 | 3.9233839E-01,               | 3.9426757E-01,  | 3.9608181E-01,  | 3.9778040E-01,  | DATA | 152 |
| 164 | 165 | 3.9936268E-01,               | 4.0082806E-01,  | 4.0217593E-01,  | 4.0340883E-01,  | DATA | 153 |
| 165 | 166 | 4.0451720E-01,               | 4.0550963E-01,  | 4.0638277E-01,  | 4.0713626E-01,  | DATA | 154 |
| 166 | 167 | 4.0776990E-01,               | 4.0828352E-01,  | 4.0867699E-01,  | 4.0895025E-01,  | DATA | 155 |
| 167 | 168 | 4.0910327E-01,               | 4.0913611E-01,  | 4.0904875E-01,  | 4.0884128E-01,  | DATA | 156 |
| 168 | 169 | 4.0851386E-01,               | 4.0806663E-01,  | 4.0749998E-01,  | 4.0681386E-01,  | DATA | 157 |
| 169 |     | DATA (BCSUN (I), I=181,216)/ |                 |                 |                 | DATA | 158 |
| 170 | 171 | 4.0600894E-01,               | 4.0508551E-01,  | 4.0404401E-01,  | 4.0288492E-01,  | DATA | 159 |
| 171 | 172 | 4.0160868E-01,               | 4.0021580E-01,  | 3.9870684E-01,  | 3.9708229E-01,  | DATA | 160 |
| 172 | 173 | 3.9334283E-01,               | 3.9348907E-01,  | 3.9132165E-01,  | 3.8944135E-01,  | DATA | 161 |
| 173 | 174 | 3.8724883E-01,               | 3.8494496E-01,  | 3.8253057E-01,  | 3.8000660E-01,  | DATA | 162 |
| 174 | 175 | 3.7737399E-01,               | 3.7463385E-01,  | 3.7178722E-01,  | 3.6883826E-01,  | DATA | 163 |
| 175 | 176 | 3.6377919E-01,               | 3.6262028E-01,  | 3.6035967E-01,  | 3.5799861E-01,  | DATA | 164 |
| 176 | 177 | 3.5253831E-01,               | 3.4898004E-01,  | 3.4532514E-01,  | 3.4157483E-01,  | DATA | 165 |
| 177 | 178 | 3.3773044E-01,               | 3.3379329E-01,  | 3.2976465E-01,  | 3.2564594E-01,  | DATA | 166 |
| 178 | 179 | 3.2143839E-01,               | 3.1714337E-01,  | 3.1276215E-01,  | 3.0829604E-01,  | DATA | 167 |
| 179 |     | DATA (BCSUN (I), I=217,252)/ |                 |                 |                 | DATA | 168 |
| 180 | 181 | 3.0374634E-01,               | 2.9911445E-01,  | 2.9440166E-01,  | 2.8960932E-01,  | DATA | 169 |
| 181 | 182 | 2.8473879E-01,               | 2.7979147E-01,  | 2.7476872E-01,  | 2.6967204E-01,  | DATA | 170 |
| 182 | 183 | 2.6450291E-01,               | 2.5926287E-01,  | 2.5395340E-01,  | 2.4857622E-01,  | DATA | 171 |
| 183 | 184 | 2.4313301E-01,               | 2.3762534E-01,  | 2.3205490E-01,  | 2.2642329E-01,  | DATA | 172 |
| 184 | 185 | 2.2073211E-01,               | 2.1498300E-01,  | 2.0917762E-01,  | 2.0331753E-01,  | DATA | 173 |
| 185 | 186 | 1.9740428E-01,               | 1.9143941E-01,  | 1.8542455E-01,  | 1.7936121E-01,  | DATA | 174 |
| 186 | 187 | 1.7325086E-01,               | 1.6709503E-01,  | 1.6089524E-01,  | 1.5465287E-01,  | DATA | 175 |
| 187 | 188 | 1.4836944E-01,               | 1.4204637E-01,  | 1.3568514E-01,  | 1.2928718E-01,  | DATA | 176 |
| 188 | 189 | 1.2285395E-01,               | 1.1638691E-01,  | 1.0988753E-01,  | 1.0335734E-01,  | DATA | 177 |
| 189 |     | DATA (BCSUN (I), I=253,288)/ |                 |                 |                 | DATA | 178 |
| 190 | 191 | 9.6797903E-02,               | 9.0210808E-02,  | 8.3597613E-02,  | 7.6960091E-02,  | DATA | 179 |
| 191 | 192 | 7.0299948E-02,               | 6.3618901E-02,  | 5.6918609E-02,  | 5.0200828E-02,  | DATA | 180 |
| 192 | 193 | 4.3467264E-02,               | 3.6719630E-02,  | 2.9959720E-02,  | 2.3189132E-02,  | DATA | 181 |
| 193 | 194 | 1.6409552E-02,               | 9.6226690E-03,  | 2.8301961E-03,  | 3.9662424E-03,  | DATA | 182 |
| 194 | 195 | -1.0765009E-02,              | -1.7564480E-02, | -2.4363049E-02, | -3.1159120E-02, | DATA | 183 |
| 195 | 196 | -3.7951099E-02,              | -4.4737391E-02, | -5.1516396E-02, | -5.8286543E-02, | DATA | 184 |
| 196 | 197 | -6.3046237E-02,              | -7.1793877E-02, | -7.8527834E-02, | -8.5246438E-02, | DATA | 185 |
| 197 | 198 | -9.1947968E-02,              | -9.8630686E-02, | -1.0529285E-01, | -1.1193255E-01, | DATA | 186 |
| 198 | 199 | -1.1854789E-01,              | -1.2513700E-01, | -1.3169804E-01, | -1.3822905E-01, | DATA | 187 |
| 199 |     | DATA (BCSUN (I), I=289,324)/ |                 |                 |                 | DATA | 188 |
| 200 | 201 | -1.4472813E-01,              | -1.5119336E-01, | -1.5762276E-01, | -1.6401447E-01, | DATA | 189 |
| 201 | 202 | -1.7036656E-01,              | -1.7667708E-01, | -1.8294406E-01, | -1.8916561E-01, | DATA | 190 |
| 202 | 203 | -1.9533980E-01,              | -2.0146475E-01, | -2.0753854E-01, | -2.1359932E-01, | DATA | 191 |
| 203 | 204 | -2.1952519E-01,              | -2.2543425E-01, | -2.3128467E-01, | -2.3707461E-01, | DATA | 192 |
| 204 | 205 | -2.4280217E-01,              | -2.4846557E-01, | -2.5406288E-01, | -2.5959821E-01, | DATA | 193 |
| 205 | 206 | -2.6305161E-01,              | -2.7043920E-01, | -2.7575293E-01, | -2.8099079E-01, | DATA | 194 |
| 206 | 207 | -2.8112074E-01,              | -2.9123075E-01, | -2.9622884E-01, | -3.0114303E-01, | DATA | 195 |
| 207 | 208 | -3.0197129E-01,              | -3.1071168E-01, | -3.1536226E-01, | -3.1997106E-01, | DATA | 196 |
| 208 | 209 | -3.2338618E-01,              | -3.2875572E-01, | -3.3302768E-01, | -3.3720029E-01, | DATA | 197 |
| 209 |     | DATA (BCSUN (I), I=325,360)/ |                 |                 |                 | DATA | 198 |



|     |     |                              |                 |                 |                 |          |
|-----|-----|------------------------------|-----------------|-----------------|-----------------|----------|
| 210 | 211 | -3.4127166E-01,              | -3.4524001E-01, | -3.4910334E-01, | -3.5286053E-01, | DATA 199 |
| 211 | 212 | -3.5650933E-01,              | -3.6004821E-01, | -3.6347561E-01, | -3.6678993E-01, | DATA 200 |
| 212 | 213 | -3.6998973E-01,              | -3.7307346E-01, | -3.7603968E-01, | -3.7888696E-01, | DATA 201 |
| 213 | 214 | -3.8161389E-01,              | -3.8421909E-01, | -3.8670117E-01, | -3.8905880E-01, | DATA 202 |
| 214 | 215 | -3.9129065E-01,              | -3.9339555E-01, | -3.9537235E-01, | -3.9721993E-01, | DATA 203 |
| 215 | 216 | -3.9893740E-01,              | -4.0052378E-01, | -4.0197823E-01, | -4.0329999E-01, | DATA 204 |
| 216 | 217 | -4.0448831E-01,              | -4.0554255E-01, | -4.0646205E-01, | -4.0724632E-01, | DATA 205 |
| 217 | 218 | -4.0789489E-01,              | -4.0840736E-01, | -4.0878342E-01, | -4.0902283E-01, | DATA 206 |
| 218 | 219 | -4.0912544E-01,              | -4.0909112E-01, | -4.0891989E-01, | -4.0861184E-01, | DATA 207 |
| 219 |     | DATA (RSUN (I), I=361, 368), |                 |                 |                 | DATA 208 |
| 220 | 221 | -4.0816708E-01,              | -4.0758581E-01, | -4.0696831E-01, | -4.0601495E-01, | DATA 209 |
| 221 | 222 | -4.0502602E-01,              | -4.0390192E-01, | -4.0264305E-01, | -4.0124999E-01, | DATA 210 |
| 222 |     | DATA (RSUN (I), I=369, 376), |                 |                 |                 | DATA 211 |
| 223 | 231 | 9.8396596E-01,               | 9.8394520E-01,  | 9.8392922E-01,  | 9.8391847E-01,  | DATA 212 |
| 224 | 232 | 9.8391325E-01,               | 9.8391386E-01,  | 9.8392064E-01,  | 9.8393372E-01,  | DATA 213 |
| 225 | 233 | 9.8395330E-01,               | 9.8397950E-01,  | 9.8401263E-01,  | 9.8405228E-01,  | DATA 214 |
| 226 | 234 | 9.8409821E-01,               | 9.8415017E-01,  | 9.8420785E-01,  | 9.8427096E-01,  | DATA 215 |
| 227 | 235 | 9.8433921E-01,               | 9.8441228E-01,  | 9.8448975E-01,  | 9.8457154E-01,  | DATA 216 |
| 228 | 236 | 9.8465741E-01,               | 9.8474718E-01,  | 9.8484068E-01,  | 9.8493784E-01,  | DATA 217 |
| 229 | 237 | 9.8503857E-01,               | 9.8514286E-01,  | 9.8525064E-01,  | 9.8536200E-01,  | DATA 218 |
| 230 | 238 | 9.8547705E-01,               | 9.8559590E-01,  | 9.8571859E-01,  | 9.8584847E-01,  | DATA 219 |
| 231 | 239 | 9.8597679E-01,               | 9.8611282E-01,  | 9.8625376E-01,  | 9.8639991E-01,  | DATA 220 |
| 232 |     | DATA (RSUN (I), I=377, 384), |                 |                 |                 | DATA 221 |
| 233 | 241 | 9.8655147E-01,               | 9.8670865E-01,  | 9.8687183E-01,  | 9.8704066E-01,  | DATA 222 |
| 234 | 242 | 9.8721502E-01,               | 9.8739470E-01,  | 9.8757955E-01,  | 9.8776920E-01,  | DATA 223 |
| 235 | 243 | 9.8796330E-01,               | 9.8816151E-01,  | 9.8836339E-01,  | 9.8856871E-01,  | DATA 224 |
| 236 | 244 | 9.8877721E-01,               | 9.8898859E-01,  | 9.8920260E-01,  | 9.8941904E-01,  | DATA 225 |
| 237 | 245 | 9.8963775E-01,               | 9.8985852E-01,  | 9.9008123E-01,  | 9.9030384E-01,  | DATA 226 |
| 238 | 246 | 9.9053236E-01,               | 9.9076077E-01,  | 9.9099103E-01,  | 9.9122340E-01,  | DATA 227 |
| 239 | 247 | 9.9145809E-01,               | 9.9169528E-01,  | 9.9193514E-01,  | 9.9217798E-01,  | DATA 228 |
| 240 | 248 | 9.9242403E-01,               | 9.9267355E-01,  | 9.9292687E-01,  | 9.9318381E-01,  | DATA 229 |
| 241 | 249 | 9.9344438E-01,               | 9.9370845E-01,  | 9.9397602E-01,  | 9.9424672E-01,  | DATA 230 |
| 242 |     | DATA (RSUN (I), I=385, 392), |                 |                 |                 | DATA 231 |
| 243 | 251 | 9.9452023E-01,               | 9.9479623E-01,  | 9.9507430E-01,  | 9.9535418E-01,  | DATA 232 |
| 244 | 252 | 9.9563555E-01,               | 9.9591807E-01,  | 9.9620143E-01,  | 9.9648533E-01,  | DATA 233 |
| 245 | 253 | 9.9676952E-01,               | 9.9705375E-01,  | 9.9733774E-01,  | 9.9762139E-01,  | DATA 234 |
| 246 | 254 | 9.9790458E-01,               | 9.9818721E-01,  | 9.9846910E-01,  | 9.9875051E-01,  | DATA 235 |
| 247 | 255 | 9.9903154E-01,               | 9.9931234E-01,  | 9.9959302E-01,  | 9.9987391E-01,  | DATA 236 |
| 248 | 256 | 1.0001553E 00,               | 1.0004373E 00,  | 1.0007204E 00,  | 1.0010046E 00,  | DATA 237 |
| 249 | 257 | 1.0012898E 00,               | 1.0015761E 00,  | 1.0018637E 00,  | 1.0021522E 00,  | DATA 238 |
| 250 | 258 | 1.0024413E 00,               | 1.0027309E 00,  | 1.0030206E 00,  | 1.0033102E 00,  | DATA 239 |
| 251 | 259 | 1.0035993E 00,               | 1.0038876E 00,  | 1.0041749E 00,  | 1.0044606E 00,  | DATA 240 |
| 252 |     | DATA (RSUN (I), I=393, 400), |                 |                 |                 | DATA 241 |
| 253 | 261 | 1.0047447E 00,               | 1.0050266E 00,  | 1.0053063E 00,  | 1.0055833E 00,  | DATA 242 |
| 254 | 262 | 1.0058576E 00,               | 1.0061288E 00,  | 1.0063969E 00,  | 1.0066619E 00,  | DATA 243 |
| 255 | 263 | 1.0069239E 00,               | 1.0071829E 00,  | 1.0074392E 00,  | 1.0076929E 00,  | DATA 244 |
| 256 | 264 | 1.0079444E 00,               | 1.0081939E 00,  | 1.0084418E 00,  | 1.0086882E 00,  | DATA 245 |
| 257 | 265 | 1.0089332E 00,               | 1.0091769E 00,  | 1.0094195E 00,  | 1.0096609E 00,  | DATA 246 |
| 258 | 266 | 1.0099039E 00,               | 1.0101394E 00,  | 1.0103762E 00,  | 1.0106111E 00,  | DATA 247 |
| 259 | 267 | 1.0108438E 00,               | 1.0110741E 00,  | 1.0113016E 00,  | 1.0115261E 00,  | DATA 248 |
| 260 | 268 | 1.0117472E 00,               | 1.0119647E 00,  | 1.0121782E 00,  | 1.0123875E 00,  | DATA 249 |
| 261 | 269 | 1.0125922E 00,               | 1.0127922E 00,  | 1.0129870E 00,  | 1.0131767E 00,  | DATA 250 |
| 262 |     | DATA (RSUN (I), I=401, 408), |                 |                 |                 | DATA 251 |
| 263 | 271 | 1.0133615E 00,               | 1.0135412E 00,  | 1.0137159E 00,  | 1.0138859E 00,  | DATA 252 |
| 264 | 272 | 1.0140515E 00,               | 1.0142131E 00,  | 1.0143710E 00,  | 1.0145253E 00,  | DATA 253 |
| 265 | 273 | 1.0146763E 00,               | 1.0148241E 00,  | 1.0149691E 00,  | 1.0151111E 00,  | DATA 254 |
| 266 | 274 | 1.0152903E 00,               | 1.0153865E 00,  | 1.0155197E 00,  | 1.0156498E 00,  | DATA 255 |
| 267 | 275 | 1.0157766E 00,               | 1.0158999E 00,  | 1.0160196E 00,  | 1.0161353E 00,  | DATA 256 |
| 268 | 276 | 1.0162468E 00,               | 1.0163538E 00,  | 1.0164561E 00,  | 1.0165534E 00,  | DATA 257 |
| 269 | 277 | 1.0166453E 00,               | 1.0167314E 00,  | 1.0168116E 00,  | 1.0168857E 00,  | DATA 258 |
| 270 | 278 | 1.0169938E 00,               | 1.0170156E 00,  | 1.0170711E 00,  | 1.0171207E 00,  | DATA 259 |
| 271 | 279 | 1.0171647E 00,               | 1.0172034E 00,  | 1.0172371E 00,  | 1.0172660E 00,  | DATA 260 |
| 272 |     | DATA (RSUN (I), I=409, 416), |                 |                 |                 | DATA 261 |
| 273 | 281 | 1.0172906E 00,               | 1.0173109E 00,  | 1.0173274E 00,  | 1.0173402E 00,  | DATA 262 |
| 274 | 282 | 1.0173493E 00,               | 1.0173548E 00,  | 1.0173568E 00,  | 1.0173553E 00,  | DATA 263 |
| 275 | 283 | 1.0173502E 00,               | 1.0173414E 00,  | 1.0173288E 00,  | 1.0173123E 00,  | DATA 264 |
| 276 | 284 | 1.0172916E 00,               | 1.0172666E 00,  | 1.0172370E 00,  | 1.0172026E 00,  | DATA 265 |
| 277 | 285 | 1.0171631E 00,               | 1.0171181E 00,  | 1.0170673E 00,  | 1.0170106E 00,  | DATA 266 |
| 278 | 286 | 1.0169478E 00,               | 1.0168789E 00,  | 1.0168034E 00,  | 1.0167219E 00,  | DATA 267 |
| 279 | 287 | 1.0166346E 00,               | 1.0165417E 00,  | 1.0164436E 00,  | 1.0163405E 00,  | DATA 268 |
| 280 | 288 | 1.0162328E 00,               | 1.0161209E 00,  | 1.0160051E 00,  | 1.0158857E 00,  | DATA 269 |
| 281 | 289 | 1.0157627E 00,               | 1.0156364E 00,  | 1.0155069E 00,  | 1.0153744E 00,  | DATA 270 |
| 282 |     | DATA (RSUN (I), I=417, 424), |                 |                 |                 | DATA 271 |

|     |     |                                |                |                |                 |          |
|-----|-----|--------------------------------|----------------|----------------|-----------------|----------|
| 283 | 291 | 1.0452388E 00,                 | 1.0131003E 00, | 1.0149588E 00, | 1.0148142E 00,  | DATA 271 |
| 284 | 292 | 1.044665E 00,                  | 1.0143154E 00, | 1.0143361E 00, | 1.0142030E 00,  | DATA 272 |
| 285 | 293 | 1.0140411E 00,                 | 1.0138749E 00, | 1.0137043E 00, | 1.0135291E 00,  | DATA 273 |
| 286 | 294 | 1.0133490E 00,                 | 1.0131637E 00, | 1.0129731E 00, | 1.0127773E 00,  | DATA 274 |
| 287 | 295 | 1.0125766E 00,                 | 1.0123712E 00, | 1.0121612E 00, | 1.0119470E 00,  | DATA 275 |
| 288 | 296 | 1.0117291E 00,                 | 1.0115076E 00, | 1.0112833E 00, | 1.0110561E 00,  | DATA 276 |
| 289 | 297 | 1.0108264E 00,                 | 1.0105944E 00, | 1.0103609E 00, | 1.0101248E 00,  | DATA 277 |
| 290 | 298 | 1.0098875E 00,                 | 1.0096487E 00, | 1.0094084E 00, | 1.0091668E 00,  | DATA 278 |
| 291 | 299 | 1.0089238E 00,                 | 1.0086794E 00, | 1.0084336E 00, | 1.0081862E 00,  | DATA 279 |
| 292 |     | DATA (RSUN (I)) I=253,288, /   |                |                |                 | DATA 280 |
| 293 | 301 | 1.0079369E 00,                 | 1.0076856E 00, | 1.0074320E 00, | 1.0071760E 00,  | DATA 281 |
| 294 | 302 | 1.0069171E 00,                 | 1.0066553E 00, | 1.0063901E 00, | 1.0061217E 00,  | DATA 282 |
| 295 | 303 | 1.0058502E 00,                 | 1.0055757E 00, | 1.0052982E 00, | 1.0050182E 00,  | DATA 283 |
| 296 | 304 | 1.0047359E 00,                 | 1.0044517E 00, | 1.0041661E 00, | 1.0038792E 00,  | DATA 284 |
| 297 | 305 | 1.0035916E 00,                 | 1.0033033E 00, | 1.0030149E 00, | 1.0027265E 00,  | DATA 285 |
| 298 | 306 | 1.0024384E 00,                 | 1.0021508E 00, | 1.0018639E 00, | 1.0015778E 00,  | DATA 286 |
| 299 | 307 | 1.0012927E 00,                 | 1.0010083E 00, | 1.0007234E 00, | 1.0004433E 00,  | DATA 287 |
| 300 | 308 | 1.0001619E 00,                 | 9.9988110E-01, | 9.9960083E-01, | 9.9932072E-01,  | DATA 288 |
| 301 | 309 | 9.9904054E-01,                 | 9.9876002E-01, | 9.9847883E-01, | 9.9819702E-01,  | DATA 289 |
| 302 |     | DATA (RSUN (I)) I=289,324, /   |                |                |                 | DATA 290 |
| 303 | 311 | 9.9791452E-01,                 | 9.9763136E-01, | 9.9734739E-01, | 9.9706298E-01,  | DATA 291 |
| 304 | 312 | 9.9677841E-01,                 | 9.9649393E-01, | 9.9620990E-01, | 9.9592660E-01,  | DATA 292 |
| 305 | 313 | 9.9564435E-01,                 | 9.9536350E-01, | 9.9508438E-01, | 9.9480730E-01,  | DATA 293 |
| 306 | 314 | 9.9453256E-01,                 | 9.9426045E-01, | 9.9399122E-01, | 9.9372508E-01,  | DATA 294 |
| 307 | 315 | 9.9346223E-01,                 | 9.9320283E-01, | 9.9294707E-01, | 9.9269482E-01,  | DATA 295 |
| 308 | 316 | 9.9244399E-01,                 | 9.9220046E-01, | 9.9195823E-01, | 9.9171890E-01,  | DATA 296 |
| 309 | 317 | 9.9148226E-01,                 | 9.9124800E-01, | 9.9101531E-01, | 9.9078561E-01,  | DATA 297 |
| 310 | 318 | 9.9055725E-01,                 | 9.9033062E-01, | 9.9010532E-01, | 9.8988219E-01,  | DATA 298 |
| 311 | 319 | 9.8966074E-01,                 | 9.8944138E-01, | 9.8922426E-01, | 9.8900967E-01,  | DATA 299 |
| 312 |     | DATA (RSUN (I)) I=325,360, /   |                |                |                 | DATA 300 |
| 313 | 321 | 9.8879790E-01,                 | 9.8858920E-01, | 9.8838390E-01, | 9.8818230E-01,  | DATA 301 |
| 314 | 322 | 9.8798469E-01,                 | 9.8779139E-01, | 9.8760264E-01, | 9.8741874E-01,  | DATA 302 |
| 315 | 323 | 9.8723996E-01,                 | 9.8706652E-01, | 9.8689874E-01, | 9.8673651E-01,  | DATA 303 |
| 316 | 324 | 9.8657980E-01,                 | 9.8642857E-01, | 9.8628286E-01, | 9.8614231E-01,  | DATA 304 |
| 317 | 325 | 9.8600662E-01,                 | 9.8587551E-01, | 9.8574862E-01, | 9.8562579E-01,  | DATA 305 |
| 318 | 326 | 9.8550680E-01,                 | 9.8539142E-01, | 9.8527939E-01, | 9.8517079E-01,  | DATA 306 |
| 319 | 327 | 9.8505561E-01,                 | 9.8496391E-01, | 9.8486570E-01, | 9.8477118E-01,  | DATA 307 |
| 320 | 328 | 9.8468031E-01,                 | 9.8459389E-01, | 9.8451133E-01, | 9.8443368E-01,  | DATA 308 |
| 321 | 329 | 9.8436059E-01,                 | 9.8429254E-01, | 9.8422970E-01, | 9.8417244E-01,  | DATA 309 |
| 322 |     | DATA (RSUN (I)) I=361,368, /   |                |                |                 | DATA 310 |
| 323 | 331 | 9.8412105E-01,                 | 9.8407579E-01, | 9.8403697E-01, | 9.8400459E-01,  | DATA 311 |
| 324 | 332 | 9.8397874E-01,                 | 9.8395942E-01, | 9.8394682E-01, | 9.8394050E-01,  | DATA 312 |
| 325 |     | DATA (RAMOON(I)) I= 1, 38, /   |                |                |                 | DATA 312 |
| 326 | 341 | 6.0670382E 00,                 | 6.2669036E 00, | 1.9220380E-01, | 4.1370770E-01,  | DATA 313 |
| 327 | 342 | 6.5203494E-01,                 | 9.3914908E-01, | 1.1835082E 00, | 1.4689927E 00,  | DATA 314 |
| 328 | 343 | 1.7860198E 00,                 | 2.0350126E 00, | 2.2998619E 00, | 2.5490243E 00,  | DATA 315 |
| 329 | 344 | 2.7844333E 00,                 | 3.0097928E 00, | 3.2292587E 00, | 3.4466476E 00,  | DATA 316 |
| 330 | 345 | 3.6649668E 00,                 | 3.8860826E 00, | 4.1104821E 00, | 4.3372174E 00,  | DATA 317 |
| 331 | 346 | 4.5641676E 00,                 | 4.7886517E 00, | 5.0082214E 00, | 5.2213315E 00,  | DATA 318 |
| 332 | 347 | 5.4276737E 00,                 | 5.6281690E 00, | 5.8247625E 00, | 6.0201776E 00,  | DATA 319 |
| 333 | 348 | 6.2177085E 00,                 | 6.3785791E-01, | 6.5085161E-01, | 6.6710811E-01,  | DATA 320 |
| 334 | 349 | 8.1920569E-01,                 | 1.0773391E 00, | 1.3491900E 00, | 1.6278097E 00,  | DATA 321 |
| 335 |     | DATA (RAMOON(I)) I= 37, 72, /  |                |                |                 | DATA 322 |
| 336 | 351 | 1.9053206E 00,                 | 2.1747618E 00, | 2.4323833E 00, | 2.6778964E 00,  | DATA 323 |
| 337 | 352 | 2.9134251E 00,                 | 3.1422033E 00, | 3.3675690E 00, | 3.5923072E 00,  | DATA 324 |
| 338 | 353 | 3.8162300E 00,                 | 4.0459300E 00, | 4.2747415E 00, | 4.5029827E 00,  | DATA 325 |
| 339 | 354 | 4.7284772E 00,                 | 4.9492127E 00, | 5.1639034E 00, | 5.3722900E 00,  | DATA 326 |
| 340 | 355 | 5.5751624E 00,                 | 5.7742068E 00, | 5.9717973E 00, | 6.1708000E 00,  | DATA 327 |
| 341 | 356 | 9.1207087E-02,                 | 3.0265819E-01, | 5.2497448E-01, | 7.4031567E-01,  | DATA 328 |
| 342 | 357 | 1.0091796E 00,                 | 1.2696234E 00, | 1.5371188E 00, | 1.8055751E 00,  | DATA 329 |
| 343 | 358 | 2.0492702E 00,                 | 2.3245774E 00, | 2.5705657E 00, | 2.8085122E 00,  | DATA 330 |
| 344 | 359 | 3.0409470E 00,                 | 3.2707308E 00, | 3.5003361E 00, | 3.7313291E 00,  | DATA 331 |
| 345 |     | DATA (RAMOON(I)) I= 73,108, /  |                |                |                 | DATA 332 |
| 346 | 361 | 3.9640504E 00,                 | 4.1975608E 00, | 4.4299261E 00, | 4.6588109E 00,  | DATA 333 |
| 347 | 362 | 4.8821843E 00,                 | 5.0988729E 00, | 5.3088038E 00, | 5.5129722E 00,  | DATA 334 |
| 348 | 363 | 5.7132214E 00,                 | 5.9120309E 00, | 6.1123013E 00, | 6.30983814E-02, | DATA 335 |
| 349 | 364 | 2.4658784E-01,                 | 4.6970562E-01, | 7.0516823E-01, | 9.5310114E-01,  | DATA 336 |
| 350 | 365 | 1.2112798E 00,                 | 1.4751974E 00, | 1.7389633E 00, | 1.9975096E 00,  | DATA 337 |
| 351 | 366 | 2.2476869E 00,                 | 2.4889201E 00, | 2.7226920E 00, | 2.9516843E 00,  | DATA 338 |
| 352 | 367 | 3.1789407E 00,                 | 3.4071775E 00, | 3.6382188E 00, | 3.8725603E 00,  | DATA 339 |
| 353 | 368 | 4.1091756E 00,                 | 4.3457248E 00, | 4.5792149E 00, | 4.8068055E 00,  | DATA 340 |
| 354 | 369 | 5.0270463E 00,                 | 5.2392913E 00, | 5.4445493E 00, | 5.6448330E 00,  | DATA 341 |
| 355 |     | DATA (RAMOON(I)) I=1209,144, / |                |                |                 | DATA 342 |



|     |                               |               |               |               |               |          |
|-----|-------------------------------|---------------|---------------|---------------|---------------|----------|
| 856 | 371                           | 5.8428476E-01 | 6.0417883E-01 | 6.2451296E-01 | 1.7321810E-01 | DATA 343 |
| 857 | 372                           | 3.9564925E-01 | 6.3153029E-01 | 8.6131993E-01 | 1.1427676E-01 | DATA 344 |
| 858 | 373                           | 1.4107646E-01 | 1.6785463E-01 | 1.9399017E-01 | 2.1910487E-01 | DATA 345 |
| 859 | 374                           | 2.4313048E-01 | 2.6622890E-01 | 2.9871010E-01 | 3.1093021E-01 | DATA 346 |
| 860 | 375                           | 3.332347E-01  | 3.5584535E-01 | 3.7892585E-01 | 4.0242663E-01 | DATA 347 |
| 861 | 376                           | 4.2614301E-01 | 4.4974949E-01 | 4.7289339E-01 | 4.9530929E-01 | DATA 348 |
| 862 | 377                           | 5.1686392E-01 | 5.3759146E-01 | 5.5765790E-01 | 5.7732816E-01 | DATA 349 |
| 863 | 378                           | 5.9492433E-01 | 6.1682296E-01 | 6.3974248E-02 | 3.0775397E-01 | DATA 350 |
| 864 | 379                           | 5.3870542E-01 | 7.8565808E-01 | 1.0477189E-01 | 1.8204226E-01 | DATA 351 |
| 865 | DATA (RAMOON(I),I)=145,180, / |               |               |               |               | DATA 352 |
| 866 | 381                           | 1.5963177E-01 | 1.8673338E-01 | 2.1275905E-01 | 2.3748216E-01 | DATA 353 |
| 867 | 382                           | 2.6100159E-01 | 2.8361921E-01 | 3.0372119E-01 | 3.2769295E-01 | DATA 354 |
| 868 | 383                           | 3.4985968E-01 | 3.7243738E-01 | 3.9549042E-01 | 4.1890793E-01 | DATA 355 |
| 869 | 384                           | 4.4242212E-01 | 4.6568032E-01 | 4.8033033E-01 | 5.1021324E-01 | DATA 356 |
| 870 | 385                           | 5.3120785E-01 | 5.5142509E-01 | 5.7107564E-01 | 5.9045447E-01 | DATA 357 |
| 871 | 386                           | 6.0991418E-01 | 1.5281775E-02 | 2.3346437E-01 | 4.4450889E-01 | DATA 358 |
| 872 | 387                           | 6.8161512E-01 | 9.3603103E-01 | 1.8036990E-01 | 1.4846307E-01 | DATA 359 |
| 873 | 388                           | 1.7643096E-01 | 2.0365134E-01 | 2.2962372E-01 | 2.5424729E-01 | DATA 360 |
| 874 | 389                           | 2.7770979E-01 | 3.0036475E-01 | 3.2260595E-01 | 3.4479257E-01 | DATA 361 |
| 875 | DATA (RAMOON(I),I)=181,216, / |               |               |               |               | DATA 362 |
| 876 | 391                           | 3.6719609E-01 | 3.8995847E-01 | 4.1306366E-01 | 4.3633800E-01 | DATA 363 |
| 877 | 392                           | 4.5949479E-01 | 4.8221837E-01 | 5.0425635E-01 | 5.2548229E-01 | DATA 364 |
| 878 | 393                           | 5.4591278E-01 | 5.6568986E-01 | 5.8505023E-01 | 6.0429738E-01 | DATA 365 |
| 879 | 394                           | 6.2378178E-01 | 1.5567183E-01 | 3.6684223E-01 | 5.9178416E-01 | DATA 366 |
| 880 | 395                           | 8.3306591E-01 | 1.0910157E-01 | 1.8625951E-01 | 1.6413209E-01 | DATA 367 |
| 881 | 396                           | 1.9190335E-01 | 2.1887839E-01 | 2.4469076E-01 | 2.6932289E-01 | DATA 368 |
| 882 | 397                           | 2.9299815E-01 | 3.1604939E-01 | 3.3881688E-01 | 3.6157960E-01 | DATA 369 |
| 883 | 398                           | 3.8450865E-01 | 4.0763850E-01 | 4.3086327E-01 | 4.5306808E-01 | DATA 370 |
| 884 | 399                           | 4.7669365E-01 | 4.9881341E-01 | 5.2019371E-01 | 5.4081948E-01 | DATA 371 |
| 885 | DATA (RAMOON(I),I)=217,252, / |               |               |               |               | DATA 372 |
| 886 | 401                           | 5.6078829E-01 | 5.8028786E-01 | 5.9957154E-01 | 6.1893861E-01 | DATA 373 |
| 887 | 402                           | 1.0400598E-01 | 3.0939212E-01 | 5.2567916E-01 | 7.5556315E-01 | DATA 374 |
| 888 | 403                           | 1.0003284E-01 | 1.2589299E-01 | 1.9274905E-01 | 1.7999326E-01 | DATA 375 |
| 889 | 404                           | 2.0498384E-01 | 2.3323558E-01 | 2.9861567E-01 | 2.8313747E-01 | DATA 376 |
| 890 | 405                           | 3.0704217E-01 | 3.3060365E-01 | 3.5406332E-01 | 3.757249E-01  | DATA 377 |
| 891 | 406                           | 4.0115948E-01 | 4.2472626E-01 | 4.4807993E-01 | 4.7099301E-01 | DATA 378 |
| 892 | 407                           | 4.9327201E-01 | 5.1480866E-01 | 5.3560065E-01 | 5.5574511E-01 | DATA 379 |
| 893 | 408                           | 5.7541813E-01 | 5.9485224E-01 | 6.1431738E-01 | 6.3382511E-02 | DATA 380 |
| 894 | 409                           | 2.6200474E-01 | 4.7517904E-01 | 6.9967072E-01 | 9.3662257E-01 | DATA 381 |
| 895 | DATA (RAMOON(I),I)=253,288, / |               |               |               |               | DATA 382 |
| 896 | 411                           | 1.1854245E-01 | 1.4433607E-01 | 1.7059811E-01 | 1.9683159E-01 | DATA 383 |
| 897 | 412                           | 2.2363992E-01 | 2.4782757E-01 | 2.7240920E-01 | 2.9654986E-01 | DATA 384 |
| 898 | 413                           | 3.2047926E-01 | 3.4440959E-01 | 3.6846853E-01 | 3.9245577E-01 | DATA 385 |
| 899 | 414                           | 4.1683434E-01 | 4.4076631E-01 | 4.6418467E-01 | 4.8687302E-01 | DATA 386 |
| 900 | 415                           | 5.0872074E-01 | 5.2973918E-01 | 5.5004696E-01 | 5.6984206E-01 | DATA 387 |
| 901 | 416                           | 5.8937463E-01 | 6.0892576E-01 | 6.2755682E-03 | 2.8945177E-01 | DATA 388 |
| 902 | 417                           | 4.2290816E-01 | 6.4708864E-01 | 8.8278898E-01 | 1.1290710E-01 | DATA 389 |
| 903 | 418                           | 1.3830623E-01 | 1.6404539E-01 | 1.8967013E-01 | 2.1483823E-01 | DATA 390 |
| 904 | 419                           | 2.3940212E-01 | 2.6341142E-01 | 2.8705873E-01 | 3.1060396E-01 | DATA 391 |
| 905 | DATA (RAMOON(I),I)=289,324, / |               |               |               |               | DATA 392 |
| 906 | 421                           | 3.3429782E-01 | 3.5831099E-01 | 3.8267520E-01 | 4.0725287E-01 | DATA 393 |
| 907 | 422                           | 4.3175820E-01 | 4.5583599E-01 | 4.7916933E-01 | 5.0156596E-01 | DATA 394 |
| 908 | 423                           | 5.2299137E-01 | 5.4355320E-01 | 5.6346304E-01 | 5.8299809E-01 | DATA 395 |
| 909 | 424                           | 6.0247275E-01 | 6.2221905E-01 | 1.4250481E-01 | 3.8510985E-01 | DATA 396 |
| 910 | 425                           | 5.7921616E-01 | 6.1391780E-01 | 1.0643124E-01 | 1.3211499E-01 | DATA 397 |
| 911 | 426                           | 1.5813443E-01 | 1.8394262E-01 | 2.0912471E-01 | 2.3350022E-01 | DATA 398 |
| 912 | 427                           | 2.9712401E-01 | 2.8022087E-01 | 3.0310245E-01 | 3.2609044E-01 | DATA 399 |
| 913 | 428                           | 3.4944764E-01 | 3.7331301E-01 | 3.9764837E-01 | 4.2224308E-01 | DATA 400 |
| 914 | 429                           | 4.4666011E-01 | 4.7056783E-01 | 4.9356272E-01 | 5.1554866E-01 | DATA 401 |
| 915 | DATA (RAMOON(I),I)=325,360, / |               |               |               |               | DATA 402 |
| 916 | 431                           | 5.3652879E-01 | 5.5667111E-01 | 5.7624115E-01 | 5.9556289E-01 | DATA 403 |
| 917 | 432                           | 6.1499310E-01 | 6.3550983E-02 | 2.7343073E-01 | 4.9275830E-01 | DATA 404 |
| 918 | 433                           | 7.2608755E-01 | 9.7376345E-01 | 1.2333913E-01 | 1.4997711E-01 | DATA 405 |
| 919 | 434                           | 1.7661764E-01 | 2.0265647E-01 | 2.2773955E-01 | 2.5181239E-01 | DATA 406 |
| 920 | 435                           | 2.7505716E-01 | 2.9779098E-01 | 3.2037399E-01 | 3.4313452E-01 | DATA 407 |
| 921 | 436                           | 3.6631712E-01 | 3.9000385E-01 | 4.1113326E-01 | 4.3834091E-01 | DATA 408 |
| 922 | 437                           | 4.6232114E-01 | 4.8566325E-01 | 5.0809443E-01 | 5.2952874E-01 | DATA 409 |
| 923 | 438                           | 5.5002263E-01 | 5.6977743E-01 | 5.9907413E-01 | 6.0824683E-01 | DATA 410 |
| 924 | 439                           | 6.2766094E-01 | 1.9379327E-01 | 4.0414706E-01 | 6.2776470E-01 | DATA 411 |
| 925 | DATA (RAMOON(I),I)=361,368, / |               |               |               |               | DATA 412 |
| 926 | 441                           | 8.6470383E-01 | 1.1207837E-01 | 1.3867574E-01 | 1.4585221E-01 | DATA 413 |
| 927 | 442                           | 1.9288469E-01 | 2.1918297E-01 | 2.4445328E-01 | 2.6870799E-01 | DATA 414 |
| 928 | DATA (RAMOON(I),I)= 1, 361, / |               |               |               |               | DATA 414 |

|     |     |                                 |                 |                 |                 |          |
|-----|-----|---------------------------------|-----------------|-----------------|-----------------|----------|
| 429 | 431 | 6.0482706E-03,                  | 9.3448413E-02,  | 1.7923171E-01,  | 2.5943321E-01,  | DATA 415 |
| 430 | 432 | 3.2905591E-01,                  | 3.8204379E-01,  | 4.1196088E-01,  | 4.1357039E-01,  | DATA 416 |
| 431 | 433 | 3.8483349E-01,                  | 3.2805030E-01,  | 2.4923077E-01,  | 1.5619917E-01,  | DATA 417 |
| 432 | 434 | 5.6718959E-02,                  | -4.2585013E-02, | -1.3650091E-01, | -2.2103787E-01, | DATA 418 |
| 433 | 435 | -2.9309271E-01,                 | -3.5018234E-01, | -3.9033744E-01, | -4.1216662E-01, | DATA 419 |
| 434 | 436 | -4.1502245E-01,                 | -3.9915096E-01, | -3.6571404E-01, | -3.1664907E-01, | DATA 420 |
| 435 | 437 | -2.5442434E-01,                 | -1.8178784E-01, | -1.0158788E-01, | -1.6700991E-02, | DATA 421 |
| 436 | 438 | 6.9932735E-02,                  | 1.5917028E-01,  | 2.3346365E-01,  | 3.8663990E-01,  | DATA 422 |
| 437 | 439 | 3.6379879E-01,                  | 4.0154598E-01,  | 4.1480055E-01,  | 4.8016039E-01,  | DATA 423 |
| 438 |     | DATA (BCMOQN(I)), I=37, 72, /   |                 |                 |                 | DATA 424 |
| 439 | 461 | 3.5728576E-01,                  | 2.8939449E-01,  | 2.0257922E-01,  | 1.8435282E-01,  | DATA 425 |
| 440 | 462 | 2.2451643E-03,                  | -9.7108836E-02, | -1.8833758E-01, | -2.6732438E-01, | DATA 426 |
| 441 | 463 | -3.3103421E-01,                 | -3.7734156E-01, | -4.0494110E-01, | -4.1333582E-01, | DATA 427 |
| 442 | 464 | -4.0284046E-01,                 | -3.7453318E-01, | -3.8013262E-01, | -2.7183186E-01, | DATA 428 |
| 443 | 465 | -2.0214389E-01,                 | -1.2379937E-01, | -3.9708385E-02, | 4.7021884E-02,  | DATA 429 |
| 444 | 466 | 1.3302690E-01,                  | 2.1460029E-01,  | 2.8762013E-01,  | 3.4753932E-01,  | DATA 430 |
| 445 | 467 | 3.8970156E-01,                  | 4.0968495E-01,  | 4.0437429E-01,  | 3.8278009E-01,  | DATA 431 |
| 446 | 468 | 3.1855183E-01,                  | 2.3981162E-01,  | 1.8840473E-01,  | 4.9008099E-02,  | DATA 432 |
| 447 | 469 | -5.1665224E-02,                 | -1.4744565E-01, | -2.8306938E-01, | -3.8436955E-01, | DATA 433 |
| 448 |     | DATA (BCMOQN(I)), I=73, 108, /  |                 |                 |                 | DATA 434 |
| 449 | 471 | -3.5833036E-01,                 | -3.9313951E-01, | -4.0811202E-01, | -4.6360300E-01, | DATA 435 |
| 450 | 472 | -3.8080940E-01,                 | -3.151902E-01,  | -2.8787163E-01, | -2.8219781E-01, | DATA 436 |
| 451 | 473 | -1.4696416E-01,                 | -6.4817509E-02, | 2.1326531E-02,  | 1.8812790E-01,  | DATA 437 |
| 452 | 474 | 1.9174842E-01,                  | 2.6780719E-01,  | 3.8150068E-01,  | 3.7795445E-01,  | DATA 438 |
| 453 | 475 | 4.0286197E-01,                  | 4.0331479E-01,  | 3.7851493E-01,  | 3.3000740E-01,  | DATA 439 |
| 454 | 476 | 2.6133499E-01,                  | 1.7737296E-01,  | 8.3683670E-02,  | 1.2945481E-02,  | DATA 440 |
| 455 | 477 | -1.0981028E-01,                 | -1.9853760E-01, | -2.7534017E-01, | -3.8629555E-01, | DATA 441 |
| 456 | 478 | 3.7862099E-01,                  | -4.0087081E-01, | -4.0296427E-01, | -3.8599304E-01, | DATA 442 |
| 457 | 479 | -3.5185888E-01,                 | -3.0287495E-01, | -2.6146528E-01, | -1.7062885E-01, | DATA 443 |
| 458 |     | DATA (BCMOQN(I)), I=109, 144, / |                 |                 |                 | DATA 444 |
| 459 | 481 | -9.0966619E-02,                 | -6.8300688E-03, | 7.9459336E-02,  | 1.6437827E-01,  | DATA 445 |
| 460 | 482 | 2.4363580E-01,                  | 3.1219059E-01,  | 3.8459945E-01,  | 3.9579998E-01,  | DATA 446 |
| 461 | 483 | 4.0221431E-01,                  | 3.8272411E-01,  | 3.8895810E-01,  | 2.7473849E-01,  | DATA 447 |
| 462 | 484 | 1.9310402E-01,                  | 1.0546156E-01,  | 1.1119103E-02,  | 8.2862854E-02,  | DATA 448 |
| 463 | 485 | -1.7168137E-01,                 | -2.5082327E-01, | -3.1621531E-01, | -3.6451375E-01, | DATA 449 |
| 464 | 486 | -3.9346591E-01,                 | -4.0219354E-01, | -3.9123322E-01, | -3.4227608E-01, | DATA 450 |
| 465 | 487 | -3.1771377E-01,                 | -2.6018605E-01, | -1.9228098E-01, | -1.2643688E-01, | DATA 451 |
| 466 | 488 | -3.5022785E-02,                 | 4.9452113E-02,  | 1.3404950E-01,  | 2.1509536E-01,  | DATA 452 |
| 467 | 489 | 2.8796275E-01,                  | 3.4713066E-01,  | 3.8676030E-01,  | 4.6189738E-01,  | DATA 453 |
| 468 |     | DATA (BCMOQN(I)), I=145, 180, / |                 |                 |                 | DATA 454 |
| 469 | 491 | 3.8995810E-01,                  | 3.5166962E-01,  | 2.9081384E-01,  | 2.1301051E-01,  | DATA 455 |
| 470 | 492 | 1.2437889E-01,                  | 3.0686351E-02,  | -6.2943328E-02, | -1.5198005E-01, | DATA 456 |
| 471 | 493 | -2.3233991E-01,                 | -3.0030924E-01, | -3.5264076E-01, | -3.8681459E-01, | DATA 457 |
| 472 | 494 | -4.0138397E-01,                 | -3.9621693E-01, | -3.7247456E-01, | -3.3230254E-01, | DATA 458 |
| 473 | 495 | -2.7837560E-01,                 | -2.1348600E-01, | -1.4029763E-01, | -6.1291847E-02, | DATA 459 |
| 474 | 496 | 2.1125458E-02,                  | 1.0439633E-01,  | 1.8550565E-01,  | 2.6065852E-01,  | DATA 460 |
| 475 | 497 | 3.2506512E-01,                  | 3.7306509E-01,  | 3.9888352E-01,  | 3.9809334E-01,  | DATA 461 |
| 476 | 498 | 3.6924432E-01,                  | 3.1462473E-01,  | 2.3958686E-01,  | 1.5097424E-01,  | DATA 462 |
| 477 | 499 | 5.5649785E-02,                  | -4.0325281E-02, | -1.3189640E-01, | -2.1488276E-01, | DATA 463 |
| 478 |     | DATA (BCMOQN(I)), I=181, 216, / |                 |                 |                 | DATA 464 |
| 479 | 501 | -2.8976969E-01,                 | -3.4159734E-01, | -3.8001932E-01, | -3.9950788E-01, | DATA 465 |
| 480 | 502 | -3.9958889E-01,                 | -3.8094745E-01, | -3.4530548E-01, | -2.9510415E-01, | DATA 466 |
| 481 | 503 | -2.3312555E-01,                 | -1.6218866E-01, | -8.4988194E-02, | -4.8831227E-03, | DATA 467 |
| 482 | 504 | 7.7989695E-02,                  | 1.5850595E-01,  | 2.3428403E-01,  | 3.8141867E-01,  | DATA 468 |
| 483 | 505 | 3.5515434E-01,                  | 3.9013159E-01,  | 4.0125491E-01,  | 3.8514544E-01,  | DATA 469 |
| 484 | 506 | 3.4156853E-01,                  | 2.7390232E-01,  | 1.8831668E-01,  | 9.2234738E-02,  | DATA 470 |
| 485 | 507 | -7.0668361E-03,                 | -1.0327180E-01, | -1.9127094E-01, | -2.4707533E-01, | DATA 471 |
| 486 | 508 | -3.2763829E-01,                 | -3.7074602E-01, | -3.9502859E-01, | -4.8004360E-01, | DATA 472 |
| 487 | 509 | -3.8632681E-01,                 | -3.5532131E-01, | -3.0917297E-01, | -2.8043889E-01, | DATA 473 |
| 488 |     | DATA (BCMOQN(I)), I=217, 252, / |                 |                 |                 | DATA 474 |
| 489 | 511 | -1.8193791E-01,                 | -1.0638398E-01, | -2.4520165E-02, | 5.4954275E-02,  | DATA 475 |
| 490 | 512 | 1.3525955E-01,                  | 2.1137410E-01,  | 2.7935239E-01,  | 3.3669323E-01,  | DATA 476 |
| 491 | 513 | 3.7732465E-01,                  | 3.9737261E-01,  | 3.9284778E-01,  | 3.6201147E-01,  | DATA 477 |
| 492 | 514 | 3.0593107E-01,                  | 2.2865786E-01,  | 1.3647842E-01,  | 3.6730761E-02,  | DATA 478 |
| 493 | 515 | -6.3316463E-02,                 | -1.5723587E-01, | -2.3981876E-01, | -3.8716292E-01, | DATA 479 |
| 494 | 516 | -3.5662244E-01,                 | -3.8573126E-01, | -3.9712863E-01, | -3.8845276E-01, | DATA 480 |
| 495 | 517 | -3.6216330E-01,                 | -3.2031921E-01, | -2.6532353E-01, | -1.9976152E-01, | DATA 481 |
| 496 | 518 | -1.2628842E-01,                 | -4.7604860E-02, | 3.5513564E-02,  | 1.4415080E-01,  | DATA 482 |
| 497 | 519 | 1.9116592E-01,                  | 2.6111239E-01,  | 3.2020473E-01,  | 3.6440809E-01,  | DATA 483 |
| 498 |     | DATA (BCMOQN(I)), I=253, 288, / |                 |                 |                 | DATA 484 |
| 499 | 521 | 3.8974606E-01,                  | 3.9287904E-01,  | 3.7188892E-01,  | 3.2678455E-01,  | DATA 485 |
| 500 | 522 | 2.6006059E-01,                  | 1.7616476E-01,  | 8.1066310E-02,  | 1.8494913E-02,  | DATA 486 |
| 501 | 523 | -1.1572348E-01,                 | -2.0439321E-01, | -2.7933061E-01, | -3.9373529E-01, | DATA 487 |



|     |                                |                 |                 |                 |                 |          |
|-----|--------------------------------|-----------------|-----------------|-----------------|-----------------|----------|
| 502 | 524                            | -3.7433727E-01, | -3.9138827E-01, | -3.8847959E-01, | -3.6721236E-01, | DATA 488 |
| 503 | 525                            | -3.2980467E-01, | -2.7874613E-01, | -2.1637736E-01, | -1.4581088E-01, | DATA 489 |
| 504 | 526                            | -6.8964100E-02, | 1.1340966E-02,  | 9.2253407E-02,  | 1.7058107E-01,  | DATA 490 |
| 505 | 527                            | 2.4272720E-01,  | 3.0472346E-01,  | 3.5241989E-01,  | 3.8188310E-01,  | DATA 491 |
| 506 | 528                            | 3.8998617E-01,  | 3.7503900E-01,  | 3.8720879E-01,  | 2.7855233E-01,  | DATA 492 |
| 507 | 529                            | 2.0270846E-01,  | 1.1445869E-01,  | 1.9326202E-02,  | -7.6760704E-02, | DATA 493 |
| 508 | DATA (RMOON(I)), I=289, 324, / |                 |                 |                 |                 | DATA 494 |
| 509 | 531                            | -1.6780836E-01, | -2.4816751E-01, | -3.1301799E-01, | -3.5885665E-01, | DATA 495 |
| 510 | 532                            | -3.8385207E-01, | -3.8791800E-01, | -3.7244327E-01, | -3.3977785E-01, | DATA 496 |
| 511 | 533                            | -2.9268368E-01, | -2.3393248E-01, | -1.8611963E-01, | -9.1669889E-02, | DATA 497 |
| 512 | 534                            | -1.2967680E-02, | 6.7438822E-02,  | 1.4662981E-01,  | 2.2113983E-01,  | DATA 498 |
| 513 | 535                            | 2.8690336E-01,  | 3.3941775E-01,  | 3.7421605E-01,  | 3.8763897E-01,  | DATA 499 |
| 514 | 536                            | 3.7768150E-01,  | 3.4452027E-01,  | 2.9044258E-01,  | 2.4927850E-01,  | DATA 500 |
| 515 | 537                            | 1.3571014E-01,  | 4.4769398E-02,  | 4.8403861E-02,  | -1.3864889E-01, | DATA 501 |
| 516 | 538                            | -2.2087522E-01, | -2.9028723E-01, | -3.4279215E-01, | -3.7351963E-01, | DATA 502 |
| 517 | 539                            | -3.8725240E-01, | -3.7853013E-01, | -3.5133272E-01, | -3.8848728E-01, | DATA 503 |
| 518 | DATA (RMOON(I)), I=325, 360, / |                 |                 |                 |                 | DATA 504 |
| 519 | 541                            | -2.5306935E-01, | -1.8800199E-01, | -1.1590533E-01, | -3.9149408E-02, | DATA 505 |
| 520 | 542                            | 3.9962211E-02,  | 1.1893731E-01,  | 1.9482047E-01,  | 2.6396645E-01,  | DATA 506 |
| 521 | 543                            | 3.2197697E-01,  | 3.6396847E-01,  | 3.8531081E-01,  | 3.8275042E-01,  | DATA 507 |
| 522 | 544                            | 3.5545268E-01,  | 3.0534828E-01,  | 2.5658118E-01,  | 1.5447331E-01,  | DATA 508 |
| 523 | 545                            | 6.4999136E-02,  | -2.7728878E-02, | -1.1760097E-01, | -2.8046555E-01, | DATA 509 |
| 524 | 546                            | -2.7209239E-01, | -3.2868316E-01, | -3.8717939E-01, | -3.8569033E-01, | DATA 510 |
| 525 | 547                            | -3.8383465E-01, | -3.6277496E-01, | -3.2488232E-01, | -2.7318484E-01, | DATA 511 |
| 526 | 548                            | -2.1084201E-01, | -1.4080799E-01, | -6.5717307E-02, | 1.2049614E-02,  | DATA 512 |
| 527 | 549                            | 9.0180963E-02,  | 1.6617522E-01,  | 2.3706296E-01,  | 2.9915941E-01,  | DATA 513 |
| 528 | DATA (RMOON(I)), I=361, 368, / |                 |                 |                 |                 | DATA 514 |
| 529 | 551                            | 3.4801684E-01,  | 3.7874619E-01,  | 3.8689281E-01,  | 3.6073078E-01,  | DATA 515 |
| 530 | 552                            | 3.2738084E-01,  | 2.6304198E-01,  | 1.8219086E-01,  | 9.3301940E-02,  | DATA 516 |
| 531 | DATA (RMOON(I)), I=369, 372, / |                 |                 |                 |                 | DATA 516 |
| 532 | 561                            | 6.2088429E 01,  | 6.1336888E 01,  | 6.0466013E 01,  | 5.9514833E 01,  | DATA 517 |
| 533 | 562                            | 5.8340477E 01,  | 5.7615742E 01,  | 5.6822603E 01,  | 5.6241383E 01,  | DATA 518 |
| 534 | 563                            | 5.5936960E 01,  | 5.5945591E 01,  | 5.4826677E 01,  | 5.4663310E 01,  | DATA 519 |
| 535 | 564                            | 5.766574E 01,   | 5.8604688E 01,  | 5.9586258E 01,  | 6.0541145E 01,  | DATA 520 |
| 536 | 565                            | 6.1411946E 01,  | 6.2159429E 01,  | 6.2761890E 01,  | 6.3212912E 01,  | DATA 521 |
| 537 | 566                            | 6.3515662E 01,  | 6.3682776E 01,  | 6.3728226E 01,  | 6.3669703E 01,  | DATA 522 |
| 538 | 567                            | 6.3505565E 01,  | 6.3253376E 01,  | 6.2909827E 01,  | 6.2472140E 01,  | DATA 523 |
| 539 | 568                            | 6.1936854E 01,  | 6.1303562E 01,  | 6.0579095E 01,  | 5.9781653E 01,  | DATA 524 |
| 540 | 569                            | 5.8944049E 01,  | 5.8114925E 01,  | 5.7356803E 01,  | 5.6740158E 01,  | DATA 525 |
| 541 | DATA (RMOON(I)), I=373, 72, /  |                 |                 |                 |                 | DATA 526 |
| 542 | 571                            | 5.6333476E 01,  | 5.6190727E 01,  | 5.6339554E 01,  | 5.6774108E 01,  | DATA 527 |
| 543 | 572                            | 5.7455198E 01,  | 5.8317617E 01,  | 5.9281869E 01,  | 6.0266513E 01,  | DATA 528 |
| 544 | 573                            | 6.1198205E 01,  | 6.2018206E 01,  | 6.2685442E 01,  | 6.3178821E 01,  | DATA 529 |
| 545 | 574                            | 6.3485627E 01,  | 6.3618742E 01,  | 6.3593159E 01,  | 6.3432142E 01,  | DATA 530 |
| 546 | 575                            | 6.3161380E 01,  | 6.2805475E 01,  | 6.2385131E 01,  | 6.1915478E 01,  | DATA 531 |
| 547 | 576                            | 6.1405889E 01,  | 6.0861396E 01,  | 6.0285499E 01,  | 5.9683964E 01,  | DATA 532 |
| 548 | 577                            | 5.9068956E 01,  | 5.8462473E 01,  | 5.7897951E 01,  | 5.7419049E 01,  | DATA 533 |
| 549 | 578                            | 5.7075082E 01,  | 5.6913314E 01,  | 5.6969461E 01,  | 5.7258889E 01,  | DATA 534 |
| 550 | 579                            | 5.7771255E 01,  | 5.8470431E 01,  | 5.9299603E 01,  | 6.0189840E 01,  | DATA 535 |
| 551 | DATA (RMOON(I)), I=73, 108, /  |                 |                 |                 |                 | DATA 536 |
| 552 | 581                            | 6.1069504E 01,  | 6.1872600E 01,  | 6.2544796E 01,  | 6.3046993E 01,  | DATA 537 |
| 553 | 582                            | 6.3356762E 01,  | 6.3468127E 01,  | 6.3390121E 01,  | 6.3144423E 01,  | DATA 538 |
| 554 | 583                            | 6.2762242E 01,  | 6.210592E 01,   | 6.1738194E 01,  | 6.1171354E 01,  | DATA 539 |
| 555 | 584                            | 6.0610453E 01,  | 6.0077639E 01,  | 5.9586323E 01,  | 5.9142579E 01,  | DATA 540 |
| 556 | 585                            | 5.8748268E 01,  | 5.8405105E 01,  | 5.8118597E 01,  | 5.7900663E 01,  | DATA 541 |
| 557 | 586                            | 5.7769992E 01,  | 5.7749698E 01,  | 5.7862532E 01,  | 5.8124712E 01,  | DATA 542 |
| 558 | 587                            | 5.8540011E 01,  | 5.9095851E 01,  | 5.9762536E 01,  | 6.0495793E 01,  | DATA 543 |
| 559 | 588                            | 6.1241838E 01,  | 6.1943634E 01,  | 6.2547067E 01,  | 6.3006124E 01,  | DATA 544 |
| 560 | 589                            | 6.3286712E 01,  | 6.3369102E 01,  | 6.3249129E 01,  | 6.2938267E 01,  | DATA 545 |
| 561 | DATA (RMOON(I)), I=109, 144, / |                 |                 |                 |                 | DATA 546 |
| 562 | 591                            | 6.2462615E 01,  | 6.1860763E 01,  | 6.1180493E 01,  | 6.0474285E 01,  | DATA 547 |
| 563 | 592                            | 5.9793918E 01,  | 5.9184787E 01,  | 5.8680978E 01,  | 5.8302236E 01,  | DATA 548 |
| 564 | 593                            | 5.8053639E 01,  | 5.7928165E 01,  | 5.7911416E 01,  | 5.7987117E 01,  | DATA 549 |
| 565 | 594                            | 5.8141845E 01,  | 5.8367712E 01,  | 5.8662502E 01,  | 5.9027442E 01,  | DATA 550 |
| 566 | 595                            | 5.9463407E 01,  | 5.9966719E 01,  | 6.0525743E 01,  | 6.1191142E 01,  | DATA 551 |
| 567 | 596                            | 6.1716208E 01,  | 6.2279076E 01,  | 6.2766276E 01,  | 6.3136961E 01,  | DATA 552 |
| 568 | 597                            | 6.3355136E 01,  | 6.3393508E 01,  | 6.3236633E 01,  | 6.2883267E 01,  | DATA 553 |
| 569 | 598                            | 6.2347800E 01,  | 6.1660604E 01,  | 6.0867028E 01,  | 6.0024649E 01,  | DATA 554 |
| 570 | 599                            | 5.9198494E 01,  | 5.8454288E 01,  | 5.7850342E 01,  | 5.7429593E 01,  | DATA 555 |
| 571 | DATA (RMOON(I)), I=145, 180, / |                 |                 |                 |                 | DATA 556 |
| 572 | 601                            | 5.7213797E 01,  | 5.7201740E 01,  | 5.7372093E 01,  | 5.7690003E 01,  | DATA 557 |
| 573 | 602                            | 5.8115286E 01,  | 5.8609851E 01,  | 5.9142702E 01,  | 5.9691910E 01,  | DATA 558 |
| 574 | 603                            | 6.0243831E 01,  | 6.0790365E 01,  | 6.1325322E 01,  | 6.1840891E 01,  | DATA 559 |



|     |     |                               |     |            |     |            |     |            |     |          |   |
|-----|-----|-------------------------------|-----|------------|-----|------------|-----|------------|-----|----------|---|
| 975 | 604 | 6.2324963E                    | 01, | 6.2759812E | 01, | 6.3122302E | 01, | 6.3385497E | 01, | DATA 560 |   |
| 976 | 605 | 6.3321367E                    | 01, | 6.3504151E | 01, | 6.3314006E | 01, | 6.2940571E | 01, | DATA 561 |   |
| 977 | 606 | 6.2386139E                    | 01, | 6.1668162E | 01, | 6.0820776E | 01, | 5.9894794E | 01, | DATA 562 |   |
| 978 | 607 | 5.8955442E                    | 01, | 5.8077286E | 01, | 5.7336060E | 01, | 5.6798141E | 01, | DATA 563 |   |
| 979 | 608 | 5.6809715E                    | 01, | 5.6488822E | 01, | 5.6723071E | 01, | 5.7173920E | 01, | DATA 564 |   |
| 980 | 609 | 5.7785937E                    | 01, | 5.8497833E | 01, | 5.9252138E | 01, | 6.0001652E | 01, | DATA 565 |   |
| 981 |     | DATA (RMOON (I), I=181, 216)/ |     |            |     |            |     |            |     | DATA 566 | 6 |
| 982 | 611 | 6.0712215E                    | 01, | 6.1362321E | 01, | 6.1940584E | 01, | 6.2442160E | 01, | DATA 567 |   |
| 983 | 612 | 6.2864979E                    | 01, | 6.3206376E | 01, | 6.3460640E | 01, | 6.3617925E | 01, | DATA 568 |   |
| 984 | 613 | 6.3664549E                    | 01, | 6.3584501E | 01, | 6.3361924E | 01, | 6.2984430E | 01, | DATA 569 |   |
| 985 | 614 | 6.2446840E                    | 01, | 6.1754898E | 01, | 6.0928502E | 01, | 6.0004054E | 01, | DATA 570 |   |
| 986 | 615 | 5.9035137E                    | 01, | 5.8090524E | 01, | 5.7248678E | 01, | 5.6588387E | 01, | DATA 571 |   |
| 987 | 616 | 5.6176484E                    | 01, | 5.6055381E | 01, | 5.6234424E | 01, | 5.6688297E | 01, | DATA 572 |   |
| 988 | 617 | 5.7363159E                    | 01, | 5.8188097E | 01, | 5.9087918E | 01, | 5.993770E  | 01, | DATA 573 |   |
| 989 | 618 | 6.0849923E                    | 01, | 6.1616623E | 01, | 6.2269733E | 01, | 6.2798388E | 01, | DATA 574 |   |
| 990 | 619 | 6.3201324E                    | 01, | 6.3483223E | 01, | 6.3650869E | 01, | 6.3710055E | 01, | DATA 575 |   |
| 991 |     | DATA (RMOON (I), I=217, 252)/ |     |            |     |            |     |            |     | DATA 576 | 6 |
| 992 | 621 | 6.3663568E                    | 01, | 6.3510411E | 01, | 6.3246195E | 01, | 6.2864770E | 01, | DATA 577 |   |
| 993 | 622 | 6.2361053E                    | 01, | 6.1734685E | 01, | 6.0993925E | 01, | 6.0159282E | 01, | DATA 578 |   |
| 994 | 623 | 5.9266311E                    | 01, | 5.8366616E | 01, | 5.7525909E | 01, | 5.6818226E | 01, | DATA 579 |   |
| 995 | 624 | 5.6316139E                    | 01, | 5.6078263E | 01, | 5.6137146E | 01, | 5.6491545E | 01, | DATA 580 |   |
| 996 | 625 | 5.7106060E                    | 01, | 5.7918278E | 01, | 5.8850712E | 01, | 5.9823488E | 01, | DATA 581 |   |
| 997 | 626 | 6.0764484E                    | 01, | 6.1615856E | 01, | 6.2336846E | 01, | 6.2903760E | 01, | DATA 582 |   |
| 998 | 627 | 6.3307977E                    | 01, | 6.3552859E | 01, | 6.3650151E | 01, | 6.3616221E | 01, | DATA 583 |   |
| 999 | 628 | 6.3468576E                    | 01, | 6.3222994E | 01, | 6.2891597E | 01, | 6.2482068E | 01, | DATA 584 |   |
| 600 | 629 | 6.1998271E                    | 01, | 6.1442299E | 01, | 6.0817644E | 01, | 6.0132957E | 01, | DATA 585 |   |
| 601 |     | DATA (RMOON (I), I=253, 288)/ |     |            |     |            |     |            |     | DATA 586 | 6 |
| 602 | 631 | 5.9405823E                    | 01, | 5.8663768E | 01, | 5.7955423E | 01, | 5.7328786E | 01, | DATA 587 |   |
| 603 | 632 | 5.6845883E                    | 01, | 5.6563940E | 01, | 5.6526534E | 01, | 5.6753551E | 01, | DATA 588 |   |
| 604 | 633 | 5.7235249E                    | 01, | 5.7932608E | 01, | 5.8783820E | 01, | 5.9714557E | 01, | DATA 589 |   |
| 605 | 634 | 6.0648810E                    | 01, | 6.1517816E | 01, | 6.2266069E | 01, | 6.2854456E | 01, | DATA 590 |   |
| 606 | 635 | 6.3260980E                    | 01, | 6.3479709E | 01, | 6.3518538E | 01, | 6.3396230E | 01, | DATA 591 |   |
| 607 | 636 | 6.3138945E                    | 01, | 6.2776531E | 01, | 6.2338885E | 01, | 6.1852532E | 01, | DATA 592 |   |
| 608 | 637 | 6.1338743E                    | 01, | 6.0812201E | 01, | 6.0281687E | 01, | 5.9753270E | 01, | DATA 593 |   |
| 609 | 638 | 5.9231726E                    | 01, | 5.8726443E | 01, | 5.8253808E | 01, | 5.7839192E | 01, | DATA 594 |   |
| 610 | 639 | 5.7516212E                    | 01, | 5.7322955E | 01, | 5.7295444E | 01, | 5.7459610E | 01, | DATA 595 |   |
| 611 |     | DATA (RMOON (I), I=289, 324)/ |     |            |     |            |     |            |     | DATA 596 | 6 |
| 612 | 641 | 5.7823917E                    | 01, | 5.8374926E | 01, | 5.9077261E | 01, | 5.9877904E | 01, | DATA 597 |   |
| 613 | 642 | 6.0713407E                    | 01, | 6.1518006E | 01, | 6.2230935E | 01, | 6.2802001E | 01, | DATA 598 |   |
| 614 | 643 | 6.3195185E                    | 01, | 6.3390453E | 01, | 6.3384053E | 01, | 6.3187606E | 01, | DATA 599 |   |
| 615 | 644 | 6.2826186E                    | 01, | 6.2335486E | 01, | 6.1758130E | 01, | 6.1139294E | 01, | DATA 600 |   |
| 616 | 645 | 6.0521991E                    | 01, | 5.9942650E | 01, | 5.9427789E | 01, | 5.8992555E | 01, | DATA 601 |   |
| 617 | 646 | 5.8641586E                    | 01, | 5.8372045E | 01, | 5.8178081E | 01, | 5.8055469E | 01, | DATA 602 |   |
| 618 | 647 | 5.8005129E                    | 01, | 5.8034476E | 01, | 5.8156087E | 01, | 5.8383938E | 01, | DATA 603 |   |
| 619 | 648 | 5.8728122E                    | 01, | 5.9189513E | 01, | 5.9755933E | 01, | 6.0400871E | 01, | DATA 604 |   |
| 620 | 649 | 6.1085050E                    | 01, | 6.1760347E | 01, | 6.2375058E | 01, | 6.2879440E | 01, | DATA 605 |   |
| 621 |     | DATA (RMOON (I), I=325, 360)/ |     |            |     |            |     |            |     | DATA 606 | 6 |
| 622 | 651 | 6.3230709E                    | 01, | 6.3397555E | 01, | 6.3360431E | 01, | 6.3118534E | 01, | DATA 607 |   |
| 623 | 652 | 6.2685270E                    | 01, | 6.2090294E | 01, | 6.1377712E | 01, | 6.0601879E | 01, | DATA 608 |   |
| 624 | 653 | 5.9823496E                    | 01, | 5.9102787E | 01, | 5.8492460E | 01, | 5.8031115E | 01, | DATA 609 |   |
| 625 | 654 | 5.7738816E                    | 01, | 5.7616170E | 01, | 5.7647272E | 01, | 5.7865664E | 01, | DATA 610 |   |
| 626 | 655 | 5.8061504E                    | 01, | 5.8387937E | 01, | 5.8765287E | 01, | 5.9182055E | 01, | DATA 611 |   |
| 627 | 656 | 5.9633547E                    | 01, | 6.0118261E | 01, | 6.0633543E | 01, | 6.1171636E | 01, | DATA 612 |   |
| 628 | 657 | 6.1717066E                    | 01, | 6.2245868E | 01, | 6.2726695E | 01, | 6.3123547E | 01, | DATA 613 |   |
| 629 | 658 | 6.3399461E                    | 01, | 6.3520723E | 01, | 6.3460938E | 01, | 6.3204682E | 01, | DATA 614 |   |
| 630 | 659 | 6.2750529E                    | 01, | 6.2113265E | 01, | 6.1325023E | 01, | 6.0434917E | 01, | DATA 615 |   |
| 631 |     | DATA (RMOON (I), I=361, 368)/ |     |            |     |            |     |            |     | DATA 616 | 6 |
| 632 | 661 | 5.9306640E                    | 01, | 5.8613507E | 01, | 5.7830741E | 01, | 5.7225577E | 01, | DATA 617 |   |
| 633 | 662 | 5.6847003E                    | 01, | 5.6717946E | 01, | 5.6832482E | 01, | 5.7159197E | 01, | DATA 618 |   |
| 634 |     | END                           |     |            |     |            |     |            |     | DATA 619 | 6 |

29748 WORDS OF MEMORY USED BY THIS COMPILATION

71034 02 11-03-72 11.666 1974 ERMEMERIS

## PREFACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

PRIMARY SYMDEF ENTRY

TABLE 0  
SECONDARY SYMDEF ENTRY

| BLOCK    | LENGTH |
|----------|--------|
| 1 EPHBLK | 11     |
| SYNREF   |        |

END OF BINARY CARD \*1974\*19  
4273 IS THE NEXT AVAILABLE LOCATION,  
GMAP VERSION/ASSEMBLY DATES JMAP 110171/102971 JMPB 110171/102971 JMPG 110171/102971  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19421 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY;

71034 02 11-03-72 11.690 1975 EPHEMERIS

|    |         |                                                                  |      |    |
|----|---------|------------------------------------------------------------------|------|----|
| 1  | C*1975* | 1975 EPHEMERIS                                                   | DATA | 1  |
| 2  |         | SUBROUTINE TABLE                                                 | DATA | 2  |
| 3  |         | DIMENSION RASUN (369), DCSUN (369), RSUN (369)                   | DATA | 3  |
| 4  |         | DIMENSION RAMOON (369), DCMOON (369), RMOON (369)                | DATA | 4  |
| 5  |         | DIMENSION ARRAY (2214)                                           |      |    |
| 6  |         | DOUBLE PRECISION Y                                               |      |    |
| 7  |         | EQUIVALENCE (RASUN,ARRAY), (DCSUN,ARRAY(370)), (RSUN,ARRAY(739)) |      |    |
| 8  |         | EQUIVALENCE (RAMOON,ARRAY(1108)), (DCMOON,ARRAY(1477))           |      |    |
| 9  |         | EQUIVALENCE (RMOON,ARRAY(1846))                                  |      |    |
| 10 |         | COMMON /EPHBLK/ Y(4), I                                          |      |    |
| 11 |         | Y(1) = ARRAY(I)                                                  |      |    |
| 12 |         | Y(2) = ARRAY(I+1)                                                |      |    |
| 13 |         | Y(3) = ARRAY(I+2)                                                |      |    |
| 14 |         | Y(4) = ARRAY(I+3)                                                |      |    |
| 15 |         | RETURN                                                           |      |    |
| 16 |         | DATA (RASUN (I)), I = 1, 36) /                                   | DATA | 6  |
| 17 | 11      | 4.8817250E 00, 4.9010103E 00, 4.9202750E 00, 4.9395173E 00,      | DATA | 7  |
| 18 | 12      | 4.9587352E 00, 4.9779271E 00, 4.9970906E 00, 5.0162236E 00,      | DATA | 8  |
| 19 | 13      | 5.0353240E 00, 5.0543898E 00, 5.0734189E 00, 5.0924084E 00,      | DATA | 9  |
| 20 | 14      | 5.1113565E 00, 5.1302617E 00, 5.1491218E 00, 5.1679350E 00,      | DATA | 10 |
| 21 | 15      | 5.1866998E 00, 5.2054146E 00, 5.2240780E 00, 5.2426887E 00,      | DATA | 11 |
| 22 | 16      | 5.2612435E 00, 5.2797475E 00, 5.2981937E 00, 5.3165835E 00,      | DATA | 12 |
| 23 | 17      | 5.3349159E 00, 5.3531902E 00, 5.3714063E 00, 5.3895636E 00,      | DATA | 13 |
| 24 | 18      | 5.4076622E 00, 5.4257017E 00, 5.4436826E 00, 5.4616047E 00,      | DATA | 14 |
| 25 | 19      | 5.4794684E 00, 5.4972744E 00, 5.5150225E 00, 5.5327128E 00,      | DATA | 15 |
| 26 |         | DATA (RASUN (I)), I = 37, 72) /                                  | DATA | 16 |
| 27 | 21      | 5.5503454E 00, 5.5679204E 00, 5.5854379E 00, 5.6028980E 00,      | DATA | 17 |
| 28 | 22      | 5.6203008E 00, 5.6376464E 00, 5.6549334E 00, 5.6721680E 00,      | DATA | 18 |
| 29 | 23      | 5.6893446E 00, 5.7064658E 00, 5.7235323E 00, 5.7405446E 00,      | DATA | 19 |
| 30 | 24      | 5.7575034E 00, 5.7744097E 00, 5.7912642E 00, 5.8080680E 00,      | DATA | 20 |
| 31 | 25      | 5.8248218E 00, 5.8415266E 00, 5.8581836E 00, 5.8747941E 00,      | DATA | 21 |
| 32 | 26      | 5.8913594E 00, 5.9078809E 00, 5.9243603E 00, 5.9407994E 00,      | DATA | 22 |
| 33 | 27      | 5.9571998E 00, 5.9735634E 00, 5.9898917E 00, 6.0061359E 00,      | DATA | 23 |
| 34 | 28      | 6.0224476E 00, 6.0386780E 00, 6.0548783E 00, 6.0710498E 00,      | DATA | 24 |
| 35 | 29      | 6.0871937E 00, 6.1033113E 00, 6.1194039E 00, 6.1354727E 00,      | DATA | 25 |
| 36 |         | DATA (RASUN (I)), I = 73, 108) /                                 | DATA | 26 |
| 37 | 31      | 6.1515190E 00, 6.1675441E 00, 6.1835494E 00, 6.1995336E 00,      | DATA | 27 |
| 38 | 32      | 6.2155055E 00, 6.2314590E 00, 6.2473978E 00, 6.2633233E 00,      | DATA | 28 |
| 39 | 33      | 6.2792368E 00, 6.2954059E 02, 6.311847394E 02, 6.32876E 02,      | DATA | 29 |
| 40 | 34      | 5.9612224E 02, 7.5486928E 02, 9.1359040E 02, 1.0723047E 01,      | DATA | 30 |
| 41 | 35      | 1.2310315E 01, 1.3897907E 01, 1.5485974E 01, 1.7074676E 01,      | DATA | 31 |
| 42 | 36      | 1.8664163E 01, 2.0254593E 01, 2.1846086E 01, 2.3438774E 01,      | DATA | 32 |
| 43 | 37      | 2.5032784E 01, 2.6628242E 01, 2.8225273E 01, 2.9823998E 01,      | DATA | 33 |
| 44 | 38      | 3.1424528E 01, 3.3026978E 01, 3.4631453E 01, 3.6238057E 01,      | DATA | 34 |
| 45 | 39      | 3.7846883E 01, 3.9458027E 01, 4.1071578E 01, 4.2687614E 01,      | DATA | 35 |
| 46 |         | DATA (RASUN (I)), I = 109, 144) /                                | DATA | 36 |
| 47 | 41      | 4.4306216E 01, 4.5927455E 01, 4.7551433E 01, 4.9178248E 01,      | DATA | 37 |
| 48 | 42      | 5.0808004E 01, 5.2440793E 01, 5.4076762E 01, 5.5716041E 01,      | DATA | 38 |
| 49 | 43      | 5.7358753E 01, 5.9003021E 01, 6.0654935E 01, 6.2308592E 01,      | DATA | 39 |
| 50 | 44      | 6.3966072E 01, 6.5627465E 01, 6.7292823E 01, 6.8962202E 01,      | DATA | 40 |
| 51 | 45      | 7.0635653E 01, 7.2313225E 01, 7.3994955E 01, 7.5680871E 01,      | DATA | 41 |
| 52 | 46      | 7.7370995E 01, 7.9065344E 01, 8.0763918E 01, 8.2466704E 01,      | DATA | 42 |
| 53 | 47      | 8.4173687E 01, 8.5884841E 01, 8.7600123E 01, 8.9319485E 01,      | DATA | 43 |
| 54 | 48      | 9.1042871E 01, 9.2770218E 01, 9.4501492E 01, 9.6236655E 01,      | DATA | 44 |

|     |     |                               |                  |                 |                 |      |     |   |
|-----|-----|-------------------------------|------------------|-----------------|-----------------|------|-----|---|
| 55  | 49  | 9.7975674E-01,                | 9.9718493E-01,   | 1.0146512E 00,  | 1.8321552E 00/  | DATA | 45  |   |
| 56  |     | DATA (RASUN I), I=145, 180, / |                  |                 |                 | DATA | 46  | 6 |
| 57  | 51  | 1.0496969E 00,                | 1.0672756E 00,   | 1.0848911E 00,  | 1.1025426E 00,  | DATA | 47  |   |
| 58  | 52  | 1.1202296E 00,                | 1.1379516E 00,   | 1.1597074E 00,  | 1.1734965E 00,  | DATA | 48  |   |
| 59  | 53  | 1.1913176E 00,                | 1.2091700E 00,   | 1.2270524E 00,  | 1.2449637E 00,  | DATA | 49  |   |
| 60  | 54  | 1.2629026E 00,                | 1.2808679E 00,   | 1.2988579E 00,  | 1.3168710E 00,  | DATA | 50  |   |
| 61  | 55  | 1.3349057E 00,                | 1.3529601E 00,   | 1.3710322E 00,  | 1.3891200E 00,  | DATA | 51  |   |
| 62  | 56  | 1.4072213E 00,                | 1.4253343E 00,   | 1.4434573E 00,  | 1.4615884E 00,  | DATA | 52  |   |
| 63  | 57  | 1.4797238E 00,                | 1.4978678E 00,   | 1.5160130E 00,  | 1.5341600E 00,  | DATA | 53  |   |
| 64  | 58  | 1.5823074E 00,                | 1.5704536E 00,   | 1.5885971E 00,  | 1.6067364E 00,  | DATA | 54  |   |
| 65  | 59  | 1.6248700E 00,                | 1.6429966E 00,   | 1.6611143E 00,  | 1.6792244E 00/  | DATA | 55  |   |
| 66  |     | DATA (RASUN I), I=16, 216, /  |                  |                 |                 | DATA | 56  | 6 |
| 67  | 61  | 1.6973187E 00,                | 1.7154021E 00,   | 1.7334710E 00,  | 1.7515240E 00,  | DATA | 57  |   |
| 68  | 62  | 1.7695595E 00,                | 1.7875762E 00,   | 1.8055724E 00,  | 1.8235465E 00,  | DATA | 58  |   |
| 69  | 63  | 1.8414969E 00,                | 1.8594220E 00,   | 1.8773199E 00,  | 1.8951888E 00,  | DATA | 59  |   |
| 70  | 64  | 1.9130270E 00,                | 1.9308328E 00,   | 1.9486049E 00,  | 1.9663419E 00,  | DATA | 60  |   |
| 71  | 65  | 1.9840428E 00,                | 2.0017063E 00,   | 2.0193318E 00,  | 2.0369185E 00,  | DATA | 61  |   |
| 72  | 66  | 2.0544657E 00,                | 2.0719726E 00,   | 2.0894387E 00,  | 2.1068635E 00,  | DATA | 62  |   |
| 73  | 67  | 2.1242466E 00,                | 2.1415878E 00,   | 2.1588868E 00,  | 2.1761433E 00,  | DATA | 63  |   |
| 74  | 68  | 2.1933572E 00,                | 2.2105286E 00,   | 2.2276573E 00,  | 2.2447432E 00,  | DATA | 64  |   |
| 75  | 69  | 2.2617866E 00,                | 2.2787872E 00,   | 2.2957453E 00,  | 2.3126606E 00/  | DATA | 65  |   |
| 76  |     | DATA (RASUN I), I=217, 252, / |                  |                 |                 | DATA | 66  | 6 |
| 77  | 71  | 2.3295332E 00,                | 2.3463632E 00,   | 2.3631501E 00,  | 2.3798939E 00,  | DATA | 67  |   |
| 78  | 72  | 2.3965943E 00,                | 2.4132514E 00,   | 2.4298654E 00,  | 2.4464363E 00,  | DATA | 68  |   |
| 79  | 73  | 2.4629647E 00,                | 2.4794506E 00,   | 2.4958947E 00,  | 2.5122979E 00,  | DATA | 69  |   |
| 80  | 74  | 2.5286606E 00,                | 2.5449835E 00,   | 2.5612675E 00,  | 2.5775134E 00,  | DATA | 70  |   |
| 81  | 75  | 2.5937223E 00,                | 2.6098953E 00,   | 2.6260335E 00,  | 2.6421381E 00,  | DATA | 71  |   |
| 82  | 76  | 2.6582102E 00,                | 2.6742512E 00,   | 2.6902622E 00,  | 2.7062447E 00,  | DATA | 72  |   |
| 83  | 77  | 2.7221998E 00,                | 2.7381289E 00,   | 2.7540331E 00,  | 2.7699137E 00,  | DATA | 73  |   |
| 84  | 78  | 2.7857717E 00,                | 2.8016085E 00,   | 2.8174248E 00,  | 2.8332216E 00,  | DATA | 74  |   |
| 85  | 79  | 2.8489998E 00,                | 2.8647606E 00,   | 2.8805049E 00,  | 2.8962339E 00/  | DATA | 75  |   |
| 86  |     | DATA (RASUN I), I=253, 288, / |                  |                 |                 | DATA | 76  | 6 |
| 87  | 81  | 2.9119486E 00,                | 2.9276499E 00,   | 2.9433393E 00,  | 2.9590181E 00,  | DATA | 77  |   |
| 88  | 82  | 2.9746875E 00,                | 2.9903486E 00,   | 3.0060031E 00,  | 3.0216523E 00,  | DATA | 78  |   |
| 89  | 83  | 3.0372980E 00,                | 3.0529417E 00,   | 3.0685852E 00,  | 3.0842301E 00,  | DATA | 79  |   |
| 90  | 84  | 3.0998782E 00,                | 3.1155312E 00,   | 3.1311909E 00,  | 3.1468590E 00,  | DATA | 80  |   |
| 91  | 85  | 3.1625373E 00,                | 3.1782274E 00,   | 3.1939310E 00,  | 3.2096496E 00,  | DATA | 81  |   |
| 92  | 86  | 3.2253848E 00,                | 3.2411382E 00,   | 3.2569110E 00,  | 3.2727045E 00,  | DATA | 82  |   |
| 93  | 87  | 3.2885199E 00,                | 3.3043590E 00,   | 3.3202226E 00,  | 3.3361121E 00,  | DATA | 83  |   |
| 94  | 88  | 3.3520286E 00,                | 3.3679729E 00,   | 3.3839466E 00,  | 3.3999507E 00,  | DATA | 84  |   |
| 95  | 89  | 3.4159864E 00,                | 3.4320346E 00,   | 3.4481569E 00,  | 3.4642947E 00/  | DATA | 85  |   |
| 96  |     | DATA (RASUN I), I=289, 324, / |                  |                 |                 | DATA | 86  | 6 |
| 97  | 91  | 3.4804693E 00,                | 3.4966823E 00,   | 3.5129351E 00,  | 3.5292293E 00,  | DATA | 87  |   |
| 98  | 92  | 3.5455644E 00,                | 3.5619477E 00,   | 3.5783749E 00,  | 3.5948494E 00,  | DATA | 88  |   |
| 99  | 93  | 3.6113725E 00,                | 3.6279456E 00,   | 3.6445700E 00,  | 3.6612469E 00,  | DATA | 89  |   |
| 100 | 94  | 3.6779772E 00,                | 3.6947623E 00,   | 3.7116029E 00,  | 3.7284998E 00,  | DATA | 90  |   |
| 101 | 95  | 3.7454538E 00,                | 3.7624660E 00,   | 3.7795367E 00,  | 3.7966663E 00,  | DATA | 91  |   |
| 102 | 96  | 3.8138552E 00,                | 3.8311035E 00,   | 3.8484113E 00,  | 3.8657788E 00,  | DATA | 92  |   |
| 103 | 97  | 3.8832060E 00,                | 3.9006928E 00,   | 3.9182394E 00,  | 3.9358461E 00,  | DATA | 93  |   |
| 104 | 98  | 3.9535130E 00,                | 3.9712403E 00,   | 3.9890280E 00,  | 4.0068763E 00,  | DATA | 94  |   |
| 105 | 99  | 4.0247354E 00,                | 4.0427551E 00,   | 4.0607834E 00,  | 4.0788762E 00/  | DATA | 95  |   |
| 106 |     | DATA (RASUN I), I=325, 360, / |                  |                 |                 | DATA | 96  | 6 |
| 107 | 101 | 4.0970274E 00,                | 4.1152383E 00,   | 4.1335093E 00,  | 4.1518393E 00,  | DATA | 97  |   |
| 108 | 102 | 4.1702277E 00,                | 4.1886740E 00,   | 4.2071773E 00,  | 4.2257367E 00,  | DATA | 98  |   |
| 109 | 103 | 4.2443511E 00,                | 4.2630196E 00,   | 4.2817407E 00,  | 4.3005127E 00,  | DATA | 99  |   |
| 110 | 104 | 4.3193340E 00,                | 4.3382025E 00,   | 4.3571163E 00,  | 4.3760734E 00,  | DATA | 100 |   |
| 111 | 105 | 4.3950713E 00,                | 4.4141079E 00,   | 4.4331810E 00,  | 4.4522889E 00,  | DATA | 101 |   |
| 112 | 106 | 4.4714292E 00,                | 4.4905999E 00,   | 4.5097987E 00,  | 4.5290243E 00,  | DATA | 102 |   |
| 113 | 107 | 4.5482739E 00,                | 4.5675454E 00,   | 4.5868370E 00,  | 4.6061464E 00,  | DATA | 103 |   |
| 114 | 108 | 4.6254715E 00,                | 4.6448099E 00,   | 4.6641593E 00,  | 4.6835182E 00,  | DATA | 104 |   |
| 115 | 109 | 4.7028837E 00,                | 4.7222539E 00,   | 4.7416263E 00,  | 4.7609988E 00/  | DATA | 105 |   |
| 116 |     | DATA (RASUN I), I=361, 368, / |                  |                 |                 | DATA | 106 | 6 |
| 117 | 111 | 4.7803691E 00,                | 4.7997351E 00,   | 4.8190940E 00,  | 4.8384433E 00,  | DATA | 107 |   |
| 118 | 112 | 4.8577803E 00,                | 4.8771024E 00,   | 4.8964067E 00,  | 4.9156903E 00/  | DATA | 108 |   |
| 119 |     | DATA (RASUN I), I=1, 36, /    |                  |                 |                 | DATA | 109 | 6 |
| 120 | 121 | -4.0390192E-01,               | -4.0264303E-01,  | -4.0124999E-01, | -3.9972333E-01, | DATA | 109 |   |
| 121 | 122 | -3.9806370E-01,               | -3.9627186E-01,  | -3.9434874E-01, | -3.9229829E-01, | DATA | 110 |   |
| 122 | 123 | -3.9011262E-01,               | -3.87800183E-01, | -3.8536409E-01, | -3.8280069E-01, | DATA | 111 |   |
| 123 | 124 | -3.8011287E-01,               | -3.7730200E-01,  | -3.7436946E-01, | -3.7131668E-01, | DATA | 112 |   |
| 124 | 125 | -3.6814309E-01,               | -3.6483629E-01,  | -3.6145178E-01, | -3.5793318E-01, | DATA | 113 |   |
| 125 | 126 | -3.5430211E-01,               | -3.5056027E-01,  | -3.4670931E-01, | -3.4275099E-01, | DATA | 114 |   |
| 126 | 127 | -3.3968707E-01,               | -3.3451935E-01,  | -3.2902493E-01, | -3.2587941E-01, | DATA | 115 |   |
| 127 | 128 | -3.2141066E-01,               | -3.1684498E-01,  | -3.1218414E-01, | -3.0742999E-01, | DATA | 116 |   |



|     |     |                             |                 |                 |                 |      |     |   |
|-----|-----|-----------------------------|-----------------|-----------------|-----------------|------|-----|---|
| 128 | 129 | -3.0258427E=01,             | =2.9764878E=01, | =2.9262554E=01, | =2.0751656E=01/ | DATA | 117 |   |
| 129 |     | DATA (BCSUN (I),I=37,72)/   |                 |                 |                 | DATA | 118 | 6 |
| 130 | 131 | -2.8232390E=01,             | =2.7704963E=01, | =2.7169577E=01, | =2.6626450E=01, | DATA | 119 |   |
| 131 | 132 | -2.6075784E=01,             | =2.5517794E=01, | =2.4932683E=01, | =2.4380664E=01, | DATA | 120 |   |
| 132 | 133 | -2.3801947E=01,             | =2.3216735E=01, | =2.2625243E=01, | =2.2027672E=01, | DATA | 121 |   |
| 133 | 134 | -2.1424229E=01,             | =2.0815124E=01, | =2.0200557E=01, | =1.9580729E=01, | DATA | 122 |   |
| 134 | 135 | -1.8955849E=01,             | =1.8326117E=01, | =1.7691723E=01, | =1.7052860E=01, | DATA | 123 |   |
| 135 | 136 | -1.6409709E=01,             | =1.5762454E=01, | =1.5111274E=01, | =1.4456345E=01, | DATA | 124 |   |
| 136 | 137 | -1.3797844E=01,             | =1.3135943E=01, | =1.2470838E=01, | =1.1802721E=01, | DATA | 125 |   |
| 137 | 138 | -1.1131786E=01,             | =1.0458226E=01, | =9.7822397E=02, | =9.1040222E=02, | DATA | 126 |   |
| 138 | 139 | -8.4237393E=02,             | =7.7416742E=02, | =7.0379304E=02, | =6.3727293E=02/ | DATA | 127 |   |
| 139 |     | DATA (BCSUN (I),I=73,108)/  |                 |                 |                 | DATA | 128 | 6 |
| 140 | 141 | -5.6862613E=02,             | =4.9987168E=02, | =4.3102846E=02, | =3.6211523E=02, | DATA | 129 |   |
| 141 | 142 | -2.9315033E=02,             | =2.2415290E=02, | =1.5514060E=02, | =8.6131897E=03, | DATA | 130 |   |
| 142 | 143 | -1.7144926E=03,             | =5.1801662E=03, | =1.2069113E=02, | =1.8950653E=02, | DATA | 131 |   |
| 143 | 144 | -2.5823113E=02,             | =3.2684823E=02, | =3.9534273E=02, | =4.6369913E=02, | DATA | 132 |   |
| 144 | 145 | -5.3190206E=02,             | =5.9993636E=02, | =6.4778561E=02, | =7.3543261E=02, | DATA | 133 |   |
| 145 | 146 | -8.0286064E=02,             | =8.7005299E=02, | =9.3699194E=02, | =1.8036601E=01, | DATA | 134 |   |
| 146 | 147 | -1.0700400E=01,             | =1.1361143E=01, | =1.2018662E=01, | =1.2672780E=01, | DATA | 135 |   |
| 147 | 148 | -1.3323326E=01,             | =1.3970130E=01, | =1.4613019E=01, | =1.5251825E=01, | DATA | 136 |   |
| 148 | 149 | -1.5886376E=01,             | =1.6516504E=01, | =1.7142041E=01, | =1.7762817E=01/ | DATA | 137 |   |
| 149 |     | DATA (BCSUN (I),I=109,144)/ |                 |                 |                 | DATA | 138 | 6 |
| 150 | 151 | -1.8378666E=01,             | =1.8989412E=01, | =1.9594899E=01, | =2.0194965E=01, | DATA | 139 |   |
| 151 | 152 | -2.0789454E=01,             | =2.1378207E=01, | =2.1961081E=01, | =2.2537932E=01, | DATA | 140 |   |
| 152 | 153 | -2.3108616E=01,             | =2.3672986E=01, | =2.4230889E=01, | =2.4782180E=01, | DATA | 141 |   |
| 153 | 154 | -2.5326697E=01,             | =2.5864293E=01, | =2.6394807E=01, | =2.6918078E=01, | DATA | 142 |   |
| 154 | 155 | -2.7433947E=01,             | =2.7942267E=01, | =2.8442874E=01, | =2.8935022E=01, | DATA | 143 |   |
| 155 | 156 | -2.9420356E=01,             | =2.9896923E=01, | =3.0365180E=01, | =3.0824977E=01, | DATA | 144 |   |
| 156 | 157 | -3.1271166E=01,             | =3.1718604E=01, | =3.2152153E=01, | =3.2576661E=01, | DATA | 145 |   |
| 157 | 158 | -3.2991946E=01,             | =3.3398014E=01, | =3.3794577E=01, | =3.4181558E=01, | DATA | 146 |   |
| 158 | 159 | -3.4558825E=01,             | =3.4926261E=01, | =3.5283744E=01, | =3.5631169E=01/ | DATA | 147 |   |
| 159 |     | DATA (BCSUN (I),I=145,180)/ |                 |                 |                 | DATA | 148 | 6 |
| 160 | 161 | -3.5968418E=01,             | =3.6295391E=01, | =3.6611977E=01, | =3.6918066E=01, | DATA | 149 |   |
| 161 | 162 | -3.7213555E=01,             | =3.7498337E=01, | =3.7772312E=01, | =3.8035370E=01, | DATA | 150 |   |
| 162 | 163 | -3.8287423E=01,             | =3.8528373E=01, | =3.8758134E=01, | =3.8976621E=01, | DATA | 151 |   |
| 163 | 164 | -3.9183750E=01,             | =3.9379452E=01, | =3.9563654E=01, | =3.9736290E=01, | DATA | 152 |   |
| 164 | 165 | -3.9897300E=01,             | =4.0046634E=01, | =4.0184233E=01, | =4.0310049E=01, | DATA | 153 |   |
| 165 | 166 | -4.0424038E=01,             | =4.0526156E=01, | =4.0616365E=01, | =4.0694637E=01, | DATA | 154 |   |
| 166 | 167 | -4.0760937E=01,             | =4.0815257E=01, | =4.0857373E=01, | =4.0887884E=01, | DATA | 155 |   |
| 167 | 168 | -4.0906182E=01,             | =4.0912466E=01, | =4.0906741E=01, | =4.0889011E=01, | DATA | 156 |   |
| 168 | 169 | -4.0859292E=01,             | =4.0817567E=01, | =4.0763879E=01, | =4.0698236E=01/ | DATA | 157 |   |
| 169 |     | DATA (BCSUN (I),I=181,216)/ |                 |                 |                 | DATA | 158 | 6 |
| 170 | 171 | -4.0620671E=01,             | =4.0531208E=01, | =4.0442988E=01, | =4.0316742E=01, | DATA | 159 |   |
| 171 | 172 | -4.0191828E=01,             | =4.0055198E=01, | =3.9906908E=01, | =3.9747026E=01, | DATA | 160 |   |
| 172 | 173 | -3.9575626E=01,             | =3.9392779E=01, | =3.9198569E=01, | =3.8993079E=01, | DATA | 161 |   |
| 173 | 174 | -3.8776395E=01,             | =3.8548613E=01, | =3.8309813E=01, | =3.8060092E=01, | DATA | 162 |   |
| 174 | 175 | -3.7799548E=01,             | =3.7528285E=01, | =3.7246403E=01, | =3.6954009E=01, | DATA | 163 |   |
| 175 | 176 | -3.6651210E=01,             | =3.6338120E=01, | =3.6014849E=01, | =3.5681501E=01, | DATA | 164 |   |
| 176 | 177 | -3.5338194E=01,             | =3.4985035E=01, | =3.4622141E=01, | =3.4249631E=01, | DATA | 165 |   |
| 177 | 178 | -3.3867622E=01,             | =3.3476238E=01, | =3.3075610E=01, | =3.2669856E=01, | DATA | 166 |   |
| 178 | 179 | -3.2247115E=01,             | =3.1819520E=01, | =3.1383214E=01, | =3.0938338E=01/ | DATA | 167 |   |
| 179 |     | DATA (BCSUN (I),I=217,252)/ |                 |                 |                 | DATA | 168 | 6 |
| 180 | 181 | -3.0485040E=01,             | =3.0023468E=01, | =2.9553781E=01, | =2.9076130E=01, | DATA | 169 |   |
| 181 | 182 | -2.8920678E=01,             | =2.8097377E=01, | =2.7396974E=01, | =2.7089030E=01, | DATA | 170 |   |
| 182 | 183 | -2.6573892E=01,             | =2.6051725E=01, | =2.5522675E=01, | =2.4986893E=01, | DATA | 171 |   |
| 183 | 184 | -2.4444534E=01,             | =2.3895743E=01, | =2.3340672E=01, | =2.2779465E=01, | DATA | 172 |   |
| 184 | 185 | -2.2212267E=01,             | =2.1639218E=01, | =2.1060465E=01, | =2.0476150E=01, | DATA | 173 |   |
| 185 | 186 | -1.9886416E=01,             | =1.9291407E=01, | =1.8691278E=01, | =1.8086166E=01, | DATA | 174 |   |
| 186 | 187 | -1.7476227E=01,             | =1.6861608E=01, | =1.6242468E=01, | =1.5618963E=01, | DATA | 175 |   |
| 187 | 188 | -1.4991253E=01,             | =1.4359495E=01, | =1.3723863E=01, | =1.3084527E=01, | DATA | 176 |   |
| 188 | 189 | -1.2441653E=01,             | =1.1795407E=01, | =1.1145956E=01, | =1.0493466E=01/ | DATA | 177 |   |
| 189 |     | DATA (BCSUN (I),I=253,288)/ |                 |                 |                 | DATA | 178 | 6 |
| 190 | 191 | -9.8381018E=02,             | =9.1800406E=02, | =8.5194349E=02, | =7.8544472E=02, | DATA | 179 |   |
| 191 | 192 | -7.1912399E=02,             | =6.5239755E=02, | =5.8548090E=02, | =5.1838950E=02, | DATA | 180 |   |
| 192 | 193 | -4.5113871E=02,             | =3.8374355E=02, | =3.1621926E=02, | =2.4858107E=02, | DATA | 181 |   |
| 193 | 194 | -1.8084420E=02,             | =1.1302400E=02, | =4.5135919E=03, | =2.2864672E=03, | DATA | 182 |   |
| 194 | 195 | -9.0781407E=03,             | =1.5877897E=02, | =2.2678080E=02, | =2.9477026E=02, | DATA | 183 |   |
| 195 | 196 | -3.6273036E=02,             | =4.3064434E=02, | =4.9849376E=02, | =5.6626067E=02, | DATA | 184 |   |
| 196 | 197 | -6.3392705E=02,             | =7.0147552E=02, | =7.6888734E=02, | =8.3614432E=02, | DATA | 185 |   |
| 197 | 198 | -9.0322815E=02,             | =9.7011906E=02, | =1.0368013E=01, | =1.1032546E=01, | DATA | 186 |   |
| 198 | 199 | -1.1694614E=01,             | =1.2354027E=01, | =1.3010608E=01, | =1.3664178E=01/ | DATA | 187 |   |
| 199 |     | DATA (BCSUN (I),I=289,324)/ |                 |                 |                 | DATA | 188 | 6 |
| 200 | 201 | -1.4314559E=01,             | =1.4961574E=01, | =1.5605046E=01, | =1.6244798E=01, | DATA | 189 |   |

|     |     |                               |                  |                  |                  |          |
|-----|-----|-------------------------------|------------------|------------------|------------------|----------|
| 201 | 202 | -01.6880652E-01,              | -01.7512429E-01, | -01.8139949E-01, | -01.8763031E-01, | DATA 190 |
| 202 | 203 | -01.9381494E-01,              | -01.9995192E-01, | -02.0603816E-01, | -02.1207296E-01, | DATA 191 |
| 203 | 204 | -02.1805401E-01,              | -02.2397934E-01, | -02.2984695E-01, | -02.3585476E-01, | DATA 192 |
| 204 | 205 | -02.4140085E-01,              | -02.4708320E-01, | -02.5269977E-01, | -02.5824856E-01, | DATA 193 |
| 205 | 206 | -02.6372756E-01,              | -02.6913467E-01, | -02.7446795E-01, | -02.7972537E-01, | DATA 194 |
| 206 | 207 | -02.8490489E-01,              | -02.9000447E-01, | -02.9502213E-01, | -02.9995998E-01, | DATA 195 |
| 207 | 208 | -03.0480400E-01,              | -03.0956437E-01, | -03.1423314E-01, | -03.1881451E-01, | DATA 196 |
| 208 | 209 | -03.2330061E-01,              | -03.2769159E-01, | -03.3198568E-01, | -03.3618110E-01, | DATA 197 |
| 209 |     | DATA (BCSUN (I), I=325, 360), |                  |                  |                  | DATA 198 |
| 210 | 211 | -03.4027605E-01,              | -03.4426879E-01, | -03.4815752E-01, | -03.5194053E-01, | DATA 199 |
| 211 | 212 | -03.5861609E-01,              | -03.5918243E-01, | -03.6263783E-01, | -03.6598068E-01, | DATA 200 |
| 212 | 213 | -03.6920928E-01,              | -03.7232213E-01, | -03.7531735E-01, | -03.7819441E-01, | DATA 201 |
| 213 | 214 | -03.8095097E-01,              | -03.8358598E-01, | -03.8609808E-01, | -03.8848594E-01, | DATA 202 |
| 214 | 215 | -03.9074836E-01,              | -03.9288408E-01, | -03.9489194E-01, | -03.9677091E-01, | DATA 203 |
| 215 | 216 | -03.9851993E-01,              | -04.0013812E-01, | -04.0162456E-01, | -04.0297846E-01, | DATA 204 |
| 216 | 217 | -04.0419911E-01,              | -04.0528582E-01, | -04.0623804E-01, | -04.0705519E-01, | DATA 205 |
| 217 | 218 | -04.0773682E-01,              | -04.0828252E-01, | -04.0869192E-01, | -04.0896470E-01, | DATA 206 |
| 218 | 219 | -04.0910066E-01,              | -04.0909955E-01, | -04.0896129E-01, | -04.0868585E-01, | DATA 207 |
| 219 |     | DATA (BCSUN (I), I=361, 368), |                  |                  |                  | DATA 208 |
| 220 | 221 | -04.0827325E-01,              | -04.0772368E-01, | -04.0703742E-01, | -04.0621481E-01, | DATA 209 |
| 221 | 222 | -04.0525630E-01,              | -04.0416246E-01, | -04.0293380E-01, | -04.0157501E-01, | DATA 210 |
| 222 |     | DATA (RSUN (I), I=1, 36),     |                  |                  |                  | DATA 210 |
| 223 | 231 | 9.8395943E-01,                | 9.8394183E-01,   | 9.8394030E-01,   | 9.8394019E-01,   | DATA 211 |
| 224 | 232 | 9.8394556E-01,                | 9.8395628E-01,   | 9.8397207E-01,   | 9.8399264E-01,   | DATA 212 |
| 225 | 233 | 9.8401770E-01,                | 9.8404688E-01,   | 9.8408014E-01,   | 9.8411734E-01,   | DATA 213 |
| 226 | 234 | 9.8415840E-01,                | 9.8420320E-01,   | 9.8425180E-01,   | 9.8430426E-01,   | DATA 214 |
| 227 | 235 | 9.8436065E-01,                | 9.8442105E-01,   | 9.8448563E-01,   | 9.8455455E-01,   | DATA 215 |
| 228 | 236 | 9.8462800E-01,                | 9.8470608E-01,   | 9.8478915E-01,   | 9.8487747E-01,   | DATA 216 |
| 229 | 237 | 9.8497130E-01,                | 9.8507088E-01,   | 9.8517636E-01,   | 9.8528790E-01,   | DATA 217 |
| 230 | 238 | 9.8540562E-01,                | 9.8552981E-01,   | 9.8566002E-01,   | 9.8579601E-01,   | DATA 218 |
| 231 | 239 | 9.8593753E-01,                | 9.8608425E-01,   | 9.8623583E-01,   | 9.8639192E-01,   | DATA 219 |
| 232 |     | DATA (RSUN (I), I=37, 72),    |                  |                  |                  | DATA 220 |
| 233 | 241 | 9.8655214E-01,                | 9.8671605E-01,   | 9.8688349E-01,   | 9.8705424E-01,   | DATA 221 |
| 234 | 242 | 9.8722810E-01,                | 9.8740484E-01,   | 9.8758440E-01,   | 9.8776670E-01,   | DATA 222 |
| 235 | 243 | 9.8795168E-01,                | 9.8813932E-01,   | 9.8832959E-01,   | 9.8852283E-01,   | DATA 223 |
| 236 | 244 | 9.8871884E-01,                | 9.8891778E-01,   | 9.8911991E-01,   | 9.8932544E-01,   | DATA 224 |
| 237 | 245 | 9.8953459E-01,                | 9.8974752E-01,   | 9.8996452E-01,   | 9.9018579E-01,   | DATA 225 |
| 238 | 246 | 9.9041151E-01,                | 9.9064205E-01,   | 9.9087708E-01,   | 9.9111643E-01,   | DATA 226 |
| 239 | 247 | 9.9135994E-01,                | 9.9160743E-01,   | 9.9185848E-01,   | 9.9211272E-01,   | DATA 227 |
| 240 | 248 | 9.9236973E-01,                | 9.9262903E-01,   | 9.9289040E-01,   | 9.9315355E-01,   | DATA 228 |
| 241 | 249 | 9.9341818E-01,                | 9.9368398E-01,   | 9.9395075E-01,   | 9.9421841E-01,   | DATA 229 |
| 242 |     | DATA (RSUN (I), I=73, 108),   |                  |                  |                  | DATA 230 |
| 243 | 251 | 9.9448672E-01,                | 9.9475556E-01,   | 9.9502490E-01,   | 9.9529472E-01,   | DATA 231 |
| 244 | 252 | 9.9556502E-01,                | 9.9583576E-01,   | 9.9610715E-01,   | 9.9637936E-01,   | DATA 232 |
| 245 | 253 | 9.9665255E-01,                | 9.9692682E-01,   | 9.9720251E-01,   | 9.9747987E-01,   | DATA 233 |
| 246 | 254 | 9.9775912E-01,                | 9.9804062E-01,   | 9.9832423E-01,   | 9.9860992E-01,   | DATA 234 |
| 247 | 255 | 9.9889760E-01,                | 9.9918732E-01,   | 9.9947864E-01,   | 9.9977122E-01,   | DATA 235 |
| 248 | 256 | 1.0000647E 00,                | 1.0000358E 00,   | 1.0000652E 00,   | 1.0000946E 00,   | DATA 236 |
| 249 | 257 | 1.0012399E 00,                | 1.0015325E 00,   | 1.0018239E 00,   | 1.0021140E 00,   | DATA 237 |
| 250 | 258 | 1.0024025E 00,                | 1.0026897E 00,   | 1.0029741E 00,   | 1.0032569E 00,   | DATA 238 |
| 251 | 259 | 1.0035377E 00,                | 1.0038162E 00,   | 1.0040927E 00,   | 1.004373E 00,    | DATA 239 |
| 252 |     | DATA (RSUN (I), I=109, 144),  |                  |                  |                  | DATA 240 |
| 253 | 261 | 1.0046401E 00,                | 1.0049112E 00,   | 1.0051809E 00,   | 1.0054495E 00,   | DATA 241 |
| 254 | 262 | 1.0057172E 00,                | 1.0059845E 00,   | 1.0062512E 00,   | 1.0065176E 00,   | DATA 242 |
| 255 | 263 | 1.0067836E 00,                | 1.0070494E 00,   | 1.0073148E 00,   | 1.0075794E 00,   | DATA 243 |
| 256 | 264 | 1.0078429E 00,                | 1.0081051E 00,   | 1.0083656E 00,   | 1.0086242E 00,   | DATA 244 |
| 257 | 265 | 1.0088805E 00,                | 1.0091341E 00,   | 1.0093847E 00,   | 1.0096322E 00,   | DATA 245 |
| 258 | 266 | 1.0098761E 00,                | 1.0101164E 00,   | 1.0103527E 00,   | 1.0105848E 00,   | DATA 246 |
| 259 | 267 | 1.0108128E 00,                | 1.0110363E 00,   | 1.0112594E 00,   | 1.0114704E 00,   | DATA 247 |
| 260 | 268 | 1.0116811E 00,                | 1.0118878E 00,   | 1.0120907E 00,   | 1.0122901E 00,   | DATA 248 |
| 261 | 269 | 1.0124863E 00,                | 1.0126796E 00,   | 1.0128703E 00,   | 1.0130584E 00,   | DATA 249 |
| 262 |     | DATA (RSUN (I), I=145, 180),  |                  |                  |                  | DATA 250 |
| 263 | 271 | 1.0132442E 00,                | 1.0134279E 00,   | 1.0136093E 00,   | 1.0137883E 00,   | DATA 251 |
| 264 | 272 | 1.0139647E 00,                | 1.0141385E 00,   | 1.0143092E 00,   | 1.0144767E 00,   | DATA 252 |
| 265 | 273 | 1.0146407E 00,                | 1.0148008E 00,   | 1.0149569E 00,   | 1.0151085E 00,   | DATA 253 |
| 266 | 274 | 1.0152555E 00,                | 1.0153973E 00,   | 1.0155348E 00,   | 1.0156661E 00,   | DATA 254 |
| 267 | 275 | 1.0157921E 00,                | 1.0159121E 00,   | 1.0160265E 00,   | 1.0161350E 00,   | DATA 255 |
| 268 | 276 | 1.0162379E 00,                | 1.0163350E 00,   | 1.0164267E 00,   | 1.0165134E 00,   | DATA 256 |
| 269 | 277 | 1.0165953E 00,                | 1.0166728E 00,   | 1.0167461E 00,   | 1.0168155E 00,   | DATA 257 |
| 270 | 278 | 1.0168813E 00,                | 1.0169438E 00,   | 1.0170028E 00,   | 1.0170585E 00,   | DATA 258 |
| 271 | 279 | 1.0171108E 00,                | 1.0171596E 00,   | 1.0172051E 00,   | 1.0172467E 00,   | DATA 259 |
| 272 |     | DATA (RSUN (I), I=181, 216),  |                  |                  |                  | DATA 260 |
| 273 | 281 | 1.0172844E 00,                | 1.0173179E 00,   | 1.0173470E 00,   | 1.0173716E 00,   | DATA 261 |
| 274 | 282 | 1.0173912E 00,                | 1.0174058E 00,   | 1.0174150E 00,   | 1.0174185E 00,   | DATA 262 |



|     |     |                                |                |                |                |          |   |
|-----|-----|--------------------------------|----------------|----------------|----------------|----------|---|
| 275 | 283 | 1.0174162E 00,                 | 1.0174078E 00, | 1.0173932E 00, | 1.0173723E 00, | DATA 263 |   |
| 276 | 284 | 1.0173453E 00,                 | 1.0173118E 00, | 1.0172724E 00, | 1.0172274E 00, | DATA 264 |   |
| 277 | 285 | 1.0171770E 00,                 | 1.0171216E 00, | 1.0170615E 00, | 1.0169970E 00, | DATA 265 |   |
| 278 | 286 | 1.0169284E 00,                 | 1.0168563E 00, | 1.0167805E 00, | 1.0167012E 00, | DATA 266 |   |
| 279 | 287 | 1.0166186E 00,                 | 1.0165328E 00, | 1.0164436E 00, | 1.0163511E 00, | DATA 267 |   |
| 280 | 288 | 1.0162551E 00,                 | 1.0161556E 00, | 1.0160523E 00, | 1.0159452E 00, | DATA 268 |   |
| 281 | 289 | 1.0158339E 00,                 | 1.015718E 00,  | 1.0155995E 00, | 1.0154737E 00, | DATA 269 |   |
| 282 |     | DATA (RSUN (1), I=217, 252, /  |                |                |                | DATA 270 | 6 |
| 283 | 291 | 1.0153439E 00,                 | 1.0152089E 00, | 1.0150685E 00, | 1.0149225E 00, | DATA 271 |   |
| 284 | 292 | 1.0147709E 00,                 | 1.0146134E 00, | 1.0144505E 00, | 1.0142823E 00, | DATA 272 |   |
| 285 | 293 | 1.0141092E 00,                 | 1.0139315E 00, | 1.0137495E 00, | 1.0135636E 00, | DATA 273 |   |
| 286 | 294 | 1.0133741E 00,                 | 1.0131817E 00, | 1.0129863E 00, | 1.0127883E 00, | DATA 274 |   |
| 287 | 295 | 1.0125878E 00,                 | 1.0123850E 00, | 1.0121800E 00, | 1.0119729E 00, | DATA 275 |   |
| 288 | 296 | 1.0117636E 00,                 | 1.0115522E 00, | 1.0113386E 00, | 1.0111227E 00, | DATA 276 |   |
| 289 | 297 | 1.0109045E 00,                 | 1.0106838E 00, | 1.0104603E 00, | 1.0102339E 00, | DATA 277 |   |
| 290 | 298 | 1.0100043E 00,                 | 1.0097714E 00, | 1.0095319E 00, | 1.0092946E 00, | DATA 278 |   |
| 291 | 299 | 1.0090504E 00,                 | 1.0088010E 00, | 1.0085493E 00, | 1.0082930E 00, | DATA 279 |   |
| 292 |     | DATA (RSUN (1), I=253, 288, /  |                |                |                | DATA 280 | 6 |
| 293 | 301 | 1.0080332E 00,                 | 1.0077699E 00, | 1.0075037E 00, | 1.0072349E 00, | DATA 281 |   |
| 294 | 302 | 1.0069640E 00,                 | 1.0066914E 00, | 1.0064173E 00, | 1.0061421E 00, | DATA 282 |   |
| 295 | 303 | 1.0058660E 00,                 | 1.0055894E 00, | 1.0053123E 00, | 1.0050350E 00, | DATA 283 |   |
| 296 | 304 | 1.0047575E 00,                 | 1.0044800E 00, | 1.0042025E 00, | 1.0039250E 00, | DATA 284 |   |
| 297 | 305 | 1.0036474E 00,                 | 1.0033697E 00, | 1.0030919E 00, | 1.0028135E 00, | DATA 285 |   |
| 298 | 306 | 1.0025347E 00,                 | 1.0022551E 00, | 1.0019745E 00, | 1.0016926E 00, | DATA 286 |   |
| 299 | 307 | 1.0014093E 00,                 | 1.0011241E 00, | 1.0008373E 00, | 1.0005489E 00, | DATA 287 |   |
| 300 | 308 | 1.0002589E 00,                 | 9.9996747E-01, | 9.9996749E-01, | 9.9998180E-01, | DATA 288 |   |
| 301 | 309 | 9.9908832E-01,                 | 9.9879504E-01, | 9.9850219E-01, | 9.9821013E-01, | DATA 289 |   |
| 302 |     | DATA (RSUN (1), I=289, 324, /  |                |                |                | DATA 290 | 6 |
| 303 | 311 | 9.9791919E-01,                 | 9.9762971E-01, | 9.9734193E-01, | 9.9705607E-01, | DATA 291 |   |
| 304 | 312 | 9.9677233E-01,                 | 9.9649089E-01, | 9.9621186E-01, | 9.9593533E-01, | DATA 292 |   |
| 305 | 313 | 9.9566132E-01,                 | 9.9538993E-01, | 9.9512100E-01, | 9.9485442E-01, | DATA 293 |   |
| 306 | 314 | 9.9459003E-01,                 | 9.9432781E-01, | 9.9406738E-01, | 9.9380847E-01, | DATA 294 |   |
| 307 | 315 | 9.9355087E-01,                 | 9.9329422E-01, | 9.9303834E-01, | 9.9278373E-01, | DATA 295 |   |
| 308 | 316 | 9.9252977E-01,                 | 9.9227645E-01, | 9.9202421E-01, | 9.9177331E-01, | DATA 296 |   |
| 309 | 317 | 9.9152406E-01,                 | 9.9127682E-01, | 9.9103189E-01, | 9.9078956E-01, | DATA 297 |   |
| 310 | 318 | 9.9055022E-01,                 | 9.9031424E-01, | 9.9008183E-01, | 9.8985331E-01, | DATA 298 |   |
| 311 | 319 | 9.8962890E-01,                 | 9.8940884E-01, | 9.8919331E-01, | 9.8898242E-01, | DATA 299 |   |
| 312 |     | DATA (RSUN (1), I=325, 360, /  |                |                |                | DATA 300 | 6 |
| 313 | 321 | 9.8877634E-01,                 | 9.8857520E-01, | 9.8837887E-01, | 9.8818731E-01, | DATA 301 |   |
| 314 | 322 | 9.8800039E-01,                 | 9.8781809E-01, | 9.8764006E-01, | 9.8746601E-01, | DATA 302 |   |
| 315 | 323 | 9.8729569E-01,                 | 9.8712878E-01, | 9.8696511E-01, | 9.8680451E-01, | DATA 303 |   |
| 316 | 324 | 9.8664679E-01,                 | 9.8649166E-01, | 9.8633939E-01, | 9.8619011E-01, | DATA 304 |   |
| 317 | 325 | 9.8604400E-01,                 | 9.8590119E-01, | 9.8576200E-01, | 9.8562670E-01, | DATA 305 |   |
| 318 | 326 | 9.8549555E-01,                 | 9.8536892E-01, | 9.8524703E-01, | 9.8513015E-01, | DATA 306 |   |
| 319 | 327 | 9.8501855E-01,                 | 9.8491245E-01, | 9.8481209E-01, | 9.8471767E-01, | DATA 307 |   |
| 320 | 328 | 9.8462936E-01,                 | 9.8454737E-01, | 9.8447163E-01, | 9.8440211E-01, | DATA 308 |   |
| 321 | 329 | 9.8433875E-01,                 | 9.8428159E-01, | 9.8423024E-01, | 9.8418439E-01, | DATA 309 |   |
| 322 |     | DATA (RSUN (1), I=361, 368, /  |                |                |                | DATA 310 | 6 |
| 323 | 331 | 9.8414378E-01,                 | 9.8410806E-01, | 9.8407695E-01, | 9.8405027E-01, | DATA 311 |   |
| 324 | 332 | 9.8402764E-01,                 | 9.8400871E-01, | 9.8399335E-01, | 9.8398223E-01, | DATA 312 |   |
| 325 |     | DATA (RAMOON(I), I= 1, 36, /   |                |                |                | DATA 312 | 6 |
| 326 | 341 | 2.4445326E 00,                 | 2.4445326E 00, | 2.4445326E 00, | 2.4445326E 00, | DATA 313 |   |
| 327 | 342 | 3.1517784E 00,                 | 3.1517784E 00, | 3.1517784E 00, | 3.1517784E 00, | DATA 314 |   |
| 328 | 343 | 4.0810732E 00,                 | 4.0810732E 00, | 4.0810732E 00, | 4.0810732E 00, | DATA 315 |   |
| 329 | 344 | 5.0150548E 00,                 | 5.0150548E 00, | 5.0150548E 00, | 5.0150548E 00, | DATA 316 |   |
| 330 | 345 | 5.8340186E 00,                 | 5.8340186E 00, | 5.8340186E 00, | 5.8340186E 00, | DATA 317 |   |
| 331 | 346 | 3.176544E-01,                  | 3.176544E-01,  | 3.176544E-01,  | 3.176544E-01,  | DATA 318 |   |
| 332 | 347 | 1.2674763E 00,                 | 1.2674763E 00, | 1.2674763E 00, | 1.2674763E 00, | DATA 319 |   |
| 333 | 348 | 2.335481E 00,                  | 2.335481E 00,  | 2.335481E 00,  | 2.335481E 00,  | DATA 320 |   |
| 334 | 349 | 3.3141324E 00,                 | 3.3141324E 00, | 3.3141324E 00, | 3.3141324E 00, | DATA 321 |   |
| 335 |     | DATA (RAMOON(I), I= 37, 72, /  |                |                |                | DATA 322 | 6 |
| 336 | 351 | 4.2654103E 00,                 | 4.2654103E 00, | 4.2654103E 00, | 4.2654103E 00, | DATA 323 |   |
| 337 | 352 | 5.1769178E 00,                 | 5.1769178E 00, | 5.1769178E 00, | 5.1769178E 00, | DATA 324 |   |
| 338 | 353 | 5.9760318E 00,                 | 5.9760318E 00, | 5.9760318E 00, | 5.9760318E 00, | DATA 325 |   |
| 339 | 354 | 4.8453887E-01,                 | 4.8453887E-01, | 4.8453887E-01, | 4.8453887E-01, | DATA 326 |   |
| 340 | 355 | 1.4269331E 00,                 | 1.4269331E 00, | 1.4269331E 00, | 1.4269331E 00, | DATA 327 |   |
| 341 | 356 | 2.4693960E 00,                 | 2.4693960E 00, | 2.4693960E 00, | 2.4693960E 00, | DATA 328 |   |
| 342 | 357 | 3.4413046E 00,                 | 3.4413046E 00, | 3.4413046E 00, | 3.4413046E 00, | DATA 329 |   |
| 343 | 358 | 4.4409008E 00,                 | 4.4409008E 00, | 4.4409008E 00, | 4.4409008E 00, | DATA 330 |   |
| 344 | 359 | 5.3345870E 00,                 | 5.3345870E 00, | 5.3345870E 00, | 5.3345870E 00, | DATA 331 |   |
| 345 |     | DATA (RAMOON(I), I= 73, 108, / |                |                |                | DATA 332 | 6 |
| 346 | 361 | 6.1202012E 00,                 | 6.1202012E 00, | 6.1202012E 00, | 6.1202012E 00, | DATA 333 |   |
| 347 | 362 | 6.5008903E-01,                 | 6.5008903E-01, | 6.5008903E-01, | 6.5008903E-01, | DATA 334 |   |
| 348 | 363 | 1.6042472E 00,                 | 1.6042472E 00, | 1.6042472E 00, | 1.6042472E 00, | DATA 335 |   |

|     |                               |               |               |               |               |          |
|-----|-------------------------------|---------------|---------------|---------------|---------------|----------|
| 849 | 364                           | 2.6092156E 00 | 2.8553334E 00 | 3.1013433E 00 | 3.2490300E 00 | DATA 336 |
| 850 | 365                           | 3.5995343E 00 | 3.8525080E 00 | 4.1060543E 00 | 4.3569736E 00 | DATA 337 |
| 851 | 366                           | 4.6016908E 00 | 4.8373214E 00 | 5.0623850E 00 | 5.2769810E 00 | DATA 338 |
| 852 | 367                           | 5.4823618E 00 | 5.6808097E 00 | 5.8749633E 00 | 6.0677059E 00 | DATA 339 |
| 853 | 368                           | 6.2619626E 00 | 1.7737276E-01 | 3.8289436E-01 | 5.9722742E-01 | DATA 340 |
| 854 | 369                           | 8.2139029E-01 | 1.0557445E 00 | 1.2979793E 00 | 1.5452847E 00 | DATA 341 |
| 855 | DATA (RAMOQN1), I=109, 144, / |               |               |               |               | DATA 342 |
| 856 | 371                           | 1.7940956E 00 | 2.0413253E 00 | 2.2852182E 00 | 2.524786E 00  | DATA 343 |
| 857 | 372                           | 2.7640686E 00 | 3.0026737E 00 | 3.2441113E 00 | 3.4900607E 00 | DATA 344 |
| 858 | 373                           | 3.7414793E 00 | 3.9970025E 00 | 4.2533853E 00 | 4.5061538E 00 | DATA 345 |
| 859 | 374                           | 4.7209597E 00 | 4.9848720E 00 | 5.2068741E 00 | 5.4177994E 00 | DATA 346 |
| 860 | 375                           | 5.6197579E 00 | 5.8156060E 00 | 6.0085546E 00 | 6.2019247E 00 | DATA 347 |
| 861 | 376                           | 1.1579707E-01 | 3.1957457E-01 | 5.3259536E-01 | 7.5642427E-01 | DATA 348 |
| 862 | 377                           | 9.9130160E-01 | 1.2354488E 00 | 1.4854552E 00 | 1.7369322E 00 | DATA 349 |
| 863 | 378                           | 1.9858424E 00 | 2.2296583E 00 | 2.4678612E 00 | 2.7017462E 00 | DATA 350 |
| 864 | 379                           | 2.9138357E 00 | 3.1671778E 00 | 3.4046258E 00 | 3.6480870E 00 | DATA 351 |
| 865 | DATA (RAMOQN1), I=145, 180, / |               |               |               |               | DATA 352 |
| 866 | 381                           | 3.8977843E 00 | 4.1517771E 00 | 4.4061416E 00 | 4.6560082E 00 | DATA 353 |
| 867 | 382                           | 4.8970640E 00 | 5.1267321E 00 | 5.3445332E 00 | 5.5517686E 00 | DATA 354 |
| 868 | 383                           | 5.7509096E 00 | 5.9450923E 00 | 6.1377565E 00 | 6.3248079E-02 | DATA 355 |
| 869 | 384                           | 2.4939310E-01 | 4.5815979E-01 | 6.7801922E-01 | 9.1019034E-01 | DATA 356 |
| 870 | 385                           | 1.1540030E 00 | 1.4065739E 00 | 1.6632213E 00 | 1.9187935E 00 | DATA 357 |
| 871 | 386                           | 2.1692576E 00 | 2.4127348E 00 | 2.6496050E 00 | 2.8819476E 00 | DATA 358 |
| 872 | 387                           | 3.1127586E 00 | 3.3451966E 00 | 3.5818620E 00 | 3.8241192E 00 | DATA 359 |
| 873 | 388                           | 4.0715119E 00 | 4.3215668E 00 | 4.5702790E 00 | 4.8132654E 00 | DATA 360 |
| 874 | 389                           | 5.0470695E 00 | 5.2699838E 00 | 5.4821939E 00 | 5.6851954E 00 | DATA 361 |
| 875 | DATA (RAMOQN1), I=181, 216, / |               |               |               |               | DATA 362 |
| 876 | 391                           | 5.8816804E 00 | 6.0747199E 00 | 6.2676896E 00 | 1.8086864E-01 | DATA 363 |
| 877 | 392                           | 3.8400833E-01 | 5.9695358E-01 | 8.2193475E-01 | 1.0597461E 00 | DATA 364 |
| 878 | 393                           | 1.3091142E 00 | 1.5665149E 00 | 1.8268812E 00 | 2.0851210E 00 | DATA 365 |
| 879 | 394                           | 2.3376702E 00 | 2.5832639E 00 | 2.8227611E 00 | 3.0584270E 00 | DATA 366 |
| 880 | 395                           | 3.2930879E 00 | 3.5293663E 00 | 3.7690119E 00 | 4.0123586E 00 | DATA 367 |
| 881 | 396                           | 4.2580538E 00 | 4.5032687E 00 | 4.7444560E 00 | 4.9783908E 00 | DATA 368 |
| 882 | 397                           | 5.2030236E 00 | 5.4178260E 00 | 5.6236623E 00 | 5.8224251E 00 | DATA 369 |
| 883 | 398                           | 6.0166606E 00 | 6.2092850E 00 | 1.2021080E-01 | 3.1894033E-01 | DATA 370 |
| 884 | 399                           | 5.2527346E-01 | 7.4175692E-01 | 9.7004645E-01 | 1.2103439E 00 | DATA 371 |
| 885 | DATA (RAMOQN1), I=217, 252, / |               |               |               |               | DATA 372 |
| 886 | 401                           | 1.4609572E 00 | 1.7183703E 00 | 1.9750817E 00 | 2.2359587E 00 | DATA 373 |
| 887 | 402                           | 2.4894108E 00 | 2.7378222E 00 | 2.9822294E 00 | 3.2245922E 00 | DATA 374 |
| 888 | 403                           | 3.4669852E 00 | 3.7108738E 00 | 3.9565837E 00 | 4.2030351E 00 | DATA 375 |
| 889 | 404                           | 4.4479452E 00 | 4.6884381E 00 | 4.9218795E 00 | 5.1469676E 00 | DATA 376 |
| 890 | 405                           | 5.3620386E 00 | 5.5689969E 00 | 5.7690396E 00 | 5.9643486E 00 | DATA 377 |
| 891 | 406                           | 6.1574415E 00 | 6.3781053E-02 | 2.6492990E-01 | 4.6700329E-01 | DATA 378 |
| 892 | 407                           | 6.7750651E-01 | 8.7770930E-01 | 1.1283047E 00 | 1.3686736E 00 | DATA 379 |
| 893 | 408                           | 1.6168028E 00 | 1.8696636E 00 | 2.1240363E 00 | 2.3774465E 00 | DATA 380 |
| 894 | 409                           | 2.6287695E 00 | 2.8782727E 00 | 3.1271729E 00 | 3.3769898E 00 | DATA 381 |
| 895 | DATA (RAMOQN1), I=253, 288, / |               |               |               |               | DATA 382 |
| 896 | 411                           | 3.6284925E 00 | 3.8816886E 00 | 4.1349616E 00 | 4.3856207E 00 | DATA 383 |
| 897 | 412                           | 4.6305670E 00 | 4.8671858E 00 | 5.0939944E 00 | 5.3108391E 00 | DATA 384 |
| 898 | 413                           | 5.5187172E 00 | 5.7194355E 00 | 5.9152768E 00 | 6.1087496E 00 | DATA 385 |
| 899 | 414                           | 1.9232509E-02 | 2.1558629E-01 | 4.1691134E-01 | 6.2511779E-01 | DATA 386 |
| 900 | 415                           | 8.4151425E-01 | 1.0665560E 00 | 1.2996602E 00 | 1.5392314E 00 | DATA 387 |
| 901 | 416                           | 1.7830050E 00 | 2.0286698E 00 | 2.2745434E 00 | 2.5200849E 00 | DATA 388 |
| 902 | 417                           | 2.7656641E 00 | 3.0128545E 00 | 3.2632434E 00 | 3.5179733E 00 | DATA 389 |
| 903 | 418                           | 3.7369143E 00 | 4.0381730E 00 | 4.2982252E 00 | 4.5527999E 00 | DATA 390 |
| 904 | 419                           | 4.7981465E 00 | 5.0320155E 00 | 5.2540458E 00 | 5.4653019E 00 | DATA 391 |
| 905 | DATA (RAMOQN1), I=289, 324, / |               |               |               |               | DATA 392 |
| 906 | 421                           | 5.6679448E 00 | 5.8646542E 00 | 6.0593106E 00 | 6.2517837E 00 | DATA 393 |
| 907 | 422                           | 1.6460159E-01 | 3.6554834E-01 | 5.3336280E-01 | 7.8923392E-01 | DATA 394 |
| 908 | 423                           | 1.0433572E 00 | 1.2447833E 00 | 1.4815316E 00 | 1.7210848E 00 | DATA 395 |
| 909 | 424                           | 1.9609565E 00 | 2.1996869E 00 | 2.4369525E 00 | 2.6737390E 00 | DATA 396 |
| 910 | 425                           | 2.9120125E 00 | 3.1911983E 00 | 3.4024809E 00 | 3.6579595E 00 | DATA 397 |
| 911 | 426                           | 3.9198167E 00 | 4.1849040E 00 | 4.4482333E 00 | 4.7044100E 00 | DATA 398 |
| 912 | 427                           | 4.9492939E 00 | 5.1809713E 00 | 5.3997505E 00 | 5.6075584E 00 | DATA 399 |
| 913 | 428                           | 5.8072428E 00 | 6.0020465E 00 | 6.1992863E 00 | 1.8097411E-01 | DATA 400 |
| 914 | 429                           | 3.0640166E-01 | 5.1282737E-01 | 7.2792815E-01 | 9.5225888E-01 | DATA 401 |
| 915 | DATA (RAMOQN1), I=325, 360, / |               |               |               |               | DATA 402 |
| 916 | 431                           | 1.1849607E 00 | 1.4237569E 00 | 1.6654247E 00 | 1.9066848E 00 | DATA 403 |
| 917 | 432                           | 2.1451539E 00 | 2.3799506E 00 | 2.6117915E 00 | 2.8426900E 00 | DATA 404 |
| 918 | 433                           | 3.0754445E 00 | 3.3130223E 00 | 3.5578254E 00 | 3.8108374E 00 | DATA 405 |
| 919 | 434                           | 4.0708323E 00 | 4.3341029E 00 | 4.5951972E 00 | 4.8485842E 00 | DATA 406 |
| 920 | 435                           | 5.0902387E 00 | 5.3186651E 00 | 5.5345217E 00 | 5.7400327E 00 | DATA 407 |
| 921 | 436                           | 5.9382661E 00 | 6.1326395E 00 | 6.3441155E-02 | 2.4038768E-01 | DATA 408 |



|     |                              |                 |                 |                 |                 |          |
|-----|------------------------------|-----------------|-----------------|-----------------|-----------------|----------|
| 422 | 437                          | 4,4333202E-01,  | 6.5474475E-01,  | 8.7614692E-01,  | 1.2076629E 00,  | DATA 409 |
| 423 | 438                          | 1.3477123E 00,  | 1.5931450E 00,  | 1.8399974E 00,  | 2.8546534E 00,  | DATA 410 |
| 424 | 439                          | 2.3248630E 00,  | 2.5602027E 00,  | 2.7215127E 00,  | 3.0224116E 00,  | DATA 411 |
| 425 | DATA (BCHMOQN1), I=361,362,  |                 |                 |                 |                 | DATA 412 |
| 426 | 441                          | 3.2246405E 00,  | 3.4914295E 00,  | 3.7347663E 00,  | 3.9850620E 00,  | DATA 413 |
| 427 | 442                          | 4.2406086E 00,  | 4.4976382E 00,  | 4.7512387E 00,  | 4.9968311E 00,  | DATA 414 |
| 428 | DATA (BCHMOQN1), I=363,      |                 |                 |                 |                 | DATA 415 |
| 429 | 451                          | 2.6304198E-01,  | 1.8219086E-01,  | 9.3301940E-02,  | 3.2379848E-03,  | DATA 416 |
| 430 | 452                          | -9.5717298E-02, | -1.8125230E-01, | -2.5571931E-01, | -3.1567498E-01, | DATA 417 |
| 431 | 453                          | -3.5819656E-01, | -3.8206750E-01, | -3.8601583E-01, | -3.7084153E-01, | DATA 418 |
| 432 | 454                          | -3.3830935E-01, | -2.9101695E-01, | -2.8197205E-01, | -1.6422812E-01, | DATA 419 |
| 433 | 455                          | -9.0664036E-02, | -1.3918313E-02, | 6.3550130E-02,  | 1.2930931E-01,  | DATA 420 |
| 434 | 456                          | 2.1074598E-01,  | 2.7483249E-01,  | 3.2795834E-01,  | 3.6593829E-01,  | DATA 421 |
| 435 | 457                          | 3.8438516E-01,  | 3.7956036E-01,  | 3.4954349E-01,  | 2.9519518E-01,  | DATA 422 |
| 436 | 458                          | 2.2033722E-01,  | 1.3103383E-01,  | 3.4393592E-02,  | -6.2557959E-02, | DATA 423 |
| 437 | 459                          | -1.5361635E-01, | -2.3371885E-01, | -2.9899200E-01, | -3.4671055E-01, | DATA 424 |
| 438 | DATA (BCHMOQN1), I=37, 72,   |                 |                 |                 |                 | DATA 425 |
| 439 | 461                          | -3.7926556E-01, | -3.8417864E-01, | -3.7406613E-01, | -3.4650160E-01, | DATA 426 |
| 440 | 462                          | -3.0376827E-01, | -2.4856665E-01, | -1.8375546E-01, | -1.1217591E-01, | DATA 427 |
| 441 | 463                          | -3.6568665E-02, | 4.0428882E-02,  | 1.3622350E-01,  | 1.8816175E-01,  | DATA 428 |
| 442 | 464                          | 2.5340143E-01,  | 3.0879689E-01,  | 3.9086580E-01,  | 3.7593840E-01,  | DATA 429 |
| 443 | 465                          | 3.8058715E-01,  | 3.6234016E-01,  | 3.2049221E-01,  | 2.5667987E-01,  | DATA 430 |
| 444 | 466                          | 1.7494685E-01,  | 8.1266558E-02,  | -1.7295265E-02, | -1.1352139E-01, | DATA 431 |
| 445 | 467                          | -2.0086526E-01, | -2.7402661E-01, | -3.2926098E-01, | -3.6447056E-01, | DATA 432 |
| 446 | 468                          | -3.7912335E-01, | -3.7402401E-01, | -3.5096880E-01, | -3.1235965E-01, | DATA 433 |
| 447 | 469                          | -2.6037037E-01, | -1.9922545E-01, | -1.3009875E-01, | -5.6104096E-02, | DATA 434 |
| 448 | DATA (BCHMOQN1), I=73, 108,  |                 |                 |                 |                 | DATA 435 |
| 449 | 471                          | 2.0160245E-02,  | 9.4044034E-02,  | 1.8877525E-01,  | 2.3540400E-01,  | DATA 436 |
| 450 | 472                          | 2.9278124E-01,  | 3.3760885E-01,  | 3.8660816E-01,  | 3.7684287E-01,  | DATA 437 |
| 451 | 473                          | 3.6617566E-01,  | 3.3375221E-01,  | 2.8035914E-01,  | 2.8855802E-01,  | DATA 438 |
| 452 | 474                          | 1.2255136E-01,  | 2.7954499E-02,  | -6.8713497E-02, | -1.8060734E-01, | DATA 439 |
| 453 | 475                          | -2.4128769E-01, | -3.0545791E-01, | -3.4955712E-01, | -3.7203468E-01, | DATA 440 |
| 454 | 476                          | -3.7335106E-01, | -3.5532309E-01, | -3.2069847E-01, | -2.7248868E-01, | DATA 441 |
| 455 | 477                          | -2.1362578E-01, | -1.4682129E-01, | -7.4590022E-02, | 6.3594858E-04,  | DATA 442 |
| 456 | 478                          | 7.6362023E-02,  | 1.4989627E-01,  | 2.3825837E-01,  | 2.7816713E-01,  | DATA 443 |
| 457 | 479                          | 3.2614639E-01,  | 3.5878320E-01,  | 3.7313706E-01,  | 3.6721847E-01,  | DATA 444 |
| 458 | DATA (BCHMOQN1), I=109, 144, |                 |                 |                 |                 | DATA 445 |
| 459 | 481                          | 3.4039000E-01,  | 2.9352224E-01,  | 2.2891615E-01,  | 1.5007086E-01,  | DATA 446 |
| 460 | 482                          | 6.1455870E-02,  | -3.1669226E-02, | -1.2345114E-01, | -2.8777179E-01, | DATA 447 |
| 461 | 483                          | -2.7879285E-01, | -3.3168668E-01, | -3.8336683E-01, | -3.7291971E-01, | DATA 448 |
| 462 | 484                          | -3.6150484E-01, | -3.3176056E-01, | -2.8701703E-01, | -2.2064872E-01, | DATA 449 |
| 463 | 485                          | -1.6572331E-01, | -9.4926761E-02, | -2.0666623E-02, | 5.4737581E-02,  | DATA 450 |
| 464 | 486                          | 1.2884133E-01,  | 1.9888673E-01,  | 2.5168846E-01,  | 3.1368046E-01,  | DATA 451 |
| 465 | 487                          | 3.5105641E-01,  | 3.7045677E-01,  | 3.8941908E-01,  | 3.4705769E-01,  | DATA 452 |
| 466 | 488                          | 3.0428464E-01,  | 2.4361625E-01,  | 1.8872563E-01,  | 8.3965917E-02,  | DATA 453 |
| 467 | 489                          | -5.8981192E-03, | -9.5822897E-02, | -1.8055801E-01, | -2.5482462E-01, | DATA 454 |
| 468 | DATA (BCHMOQN1), I=145, 180, |                 |                 |                 |                 | DATA 455 |
| 469 | 491                          | -3.1371765E-01, | -3.5333658E-01, | -3.7146301E-01, | -3.6795435E-01, | DATA 456 |
| 470 | 492                          | -3.4459633E-01, | -3.0447066E-01, | -2.5116829E-01, | -1.8817901E-01, | DATA 457 |
| 471 | 493                          | -1.1858989E-01, | -4.5053453E-02, | 3.8075047E-02,  | 1.8451774E-01,  | DATA 458 |
| 472 | 494                          | 1.7583090E-01,  | 2.4118838E-01,  | 2.9725714E-01,  | 3.4026133E-01,  | DATA 459 |
| 473 | 495                          | 3.6634118E-01,  | 3.7223602E-01,  | 3.5611928E-01,  | 3.3821203E-01,  | DATA 460 |
| 474 | 496                          | 2.6084197E-01,  | 1.8795148E-01,  | 1.0437728E-01,  | 1.5248143E-02,  | DATA 461 |
| 475 | 497                          | -7.4349862E-02, | -1.5948878E-01, | -2.3544027E-01, | -2.9780006E-01, | DATA 462 |
| 476 | 498                          | -3.4280151E-01, | -3.6780274E-01, | -3.9176484E-01, | -3.5544581E-01, | DATA 463 |
| 477 | 499                          | -3.2114970E-01, | -2.7213594E-01, | -2.1196877E-01, | -1.4404240E-01, | DATA 464 |
| 478 | DATA (BCHMOQN1), I=181, 216, |                 |                 |                 |                 | DATA 465 |
| 479 | 501                          | -7.1361305E-02, | 3.4636110E-03,  | 7.8079936E-02,  | 1.5018572E-01,  | DATA 466 |
| 480 | 502                          | 2.1729739E-01,  | 2.7654360E-01,  | 3.2559635E-01,  | 3.5759402E-01,  | DATA 467 |
| 481 | 503                          | 3.7194436E-01,  | 3.6473511E-01,  | 3.5481308E-01,  | 2.8333379E-01,  | DATA 468 |
| 482 | 504                          | 2.1370870E-01,  | 1.3096846E-01,  | 4.0906578E-02,  | -5.8638886E-02, | DATA 469 |
| 483 | 505                          | -1.3821350E-01, | -2.1693376E-01, | -2.8256642E-01, | -3.3164842E-01, | DATA 470 |
| 484 | 506                          | -3.6171306E-01, | -3.7157210E-01, | -3.8149587E-01, | -3.8313803E-01, | DATA 471 |
| 485 | 507                          | -2.8918834E-01, | -2.3288769E-01, | -1.4758422E-01, | -9.6441075E-02, | DATA 472 |
| 486 | 508                          | -2.2315796E-02, | 5.2221076E-02,  | 1.2477397E-01,  | 1.9295708E-01,  | DATA 473 |
| 487 | 509                          | 2.5421324E-01,  | 3.0568489E-01,  | 3.4407040E-01,  | 3.6598707E-01,  | DATA 474 |
| 488 | DATA (BCHMOQN1), I=217, 252, |                 |                 |                 |                 | DATA 475 |
| 489 | 511                          | 3.6822688E-01,  | 3.4559743E-01,  | 3.0666780E-01,  | 2.4427792E-01,  | DATA 476 |
| 490 | 512                          | 1.6546927E-01,  | 7.5911966E-02,  | -1.7927945E-02, | -1.8959044E-01, | DATA 477 |
| 491 | 513                          | -1.9321858E-01, | -2.6392126E-01, | -3.1797448E-01, | -3.5294884E-01, | DATA 478 |
| 492 | 514                          | -3.6779228E-01, | -3.6282016E-01, | -3.5935015E-01, | -3.8038833E-01, | DATA 479 |
| 493 | 515                          | -2.4825281E-01, | -1.8624104E-01, | -1.3740136E-01, | -4.4618239E-02, | DATA 480 |
| 494 | 516                          | 2.9410835E-02,  | 1.0213458E-01,  | 1.7106649E-01,  | 2.8368331E-01,  | DATA 481 |
| 495 | 517                          | 2.8733017E-01,  | 3.2917422E-01,  | 3.5626517E-01,  | 3.8576430E-01,  | DATA 482 |

|     |     |                                |                 |                 |                 |          |
|-----|-----|--------------------------------|-----------------|-----------------|-----------------|----------|
| 496 | 518 | 3.5836789E-01,                 | 3.2386358E-01,  | 2.7166006E-01,  | 2.8110170E-01,  | DATA 482 |
| 497 | 519 | 1.1644944E-01,                 | 2.3516033E-02,  | 7.8972201E-02,  | -1.6016149E-01, | DATA 483 |
| 498 |     | DATA (RCHOON 1), 1=253, 288, / |                 |                 |                 | DATA 484 |
| 499 | 521 | -2.3785110E-01,                | -2.9913173E-01, | -3.4079793E-01, | -3.6149460E-01, | DATA 485 |
| 500 | 522 | -3.6158549E-01,                | -3.4278274E-01, | -3.0765314E-01, | -2.5915166E-01, | DATA 486 |
| 501 | 523 | -2.0029110E-01,                | -1.337288E-01,  | -6.2944958E-02, | 1.0166978E-02,  | DATA 487 |
| 502 | 524 | 8.2797810E-02,                 | 1.5237825E-01,  | 2.1628341E-01,  | 2.7180885E-01,  | DATA 488 |
| 503 | 525 | 3.1619377E-01,                 | 3.1671738E-01,  | 3.6088976E-01,  | 3.5673290E-01,  | DATA 489 |
| 504 | 526 | 3.3310864E-01,                 | 2.9002031E-01,  | 2.2682649E-01,  | 1.5234606E-01,  | DATA 490 |
| 505 | 527 | 6.4852346E-02,                 | -2.8074983E-02, | -1.1991342E-01, | -2.8383145E-01, | DATA 491 |
| 506 | 528 | -2.7354837E-01,                | -3.2423934E-01, | -3.5321133E-01, | -3.6009926E-01, | DATA 492 |
| 507 | 529 | -3.4651109E-01,                | -3.1530855E-01, | -2.6985247E-01, | -2.1346865E-01, | DATA 493 |
| 508 |     | DATA (RCHOON 1), 1=289, 324, / |                 |                 |                 | DATA 494 |
| 509 | 531 | -1.4918211E-01,                | -7.9719870E-02, | -7.5778954E-03, | 6.4823295E-02,  | DATA 495 |
| 510 | 532 | 1.3500911E-01,                 | 2.0033870E-01,  | 2.5807779E-01,  | 3.6525969E-01,  | DATA 496 |
| 511 | 533 | 3.3905252E-01,                 | 3.5692820E-01,  | 3.9700862E-01,  | 3.3835933E-01,  | DATA 497 |
| 512 | 534 | 3.0115973E-01,                 | 2.4672208E-01,  | 1.7741223E-01,  | 9.6573868E-02,  | DATA 498 |
| 513 | 535 | 8.4992874E-03,                 | -8.1594591E-02, | -3.8771694E-01, | -2.2353601E-01, | DATA 499 |
| 514 | 536 | -3.0316658E-01,                | -3.4217877E-01, | -3.5845126E-01, | -3.5242792E-01, | DATA 500 |
| 515 | 537 | -3.2662589E-01,                | -2.8469446E-01, | -2.3051243E-01, | -1.6763141E-01, | DATA 501 |
| 516 | 538 | -9.9090939E-02,                | -2.7483600E-02, | -4.4361534E-02, | -1.1566625E-01, | DATA 502 |
| 517 | 539 | 1.8251577E-01,                 | 2.4273663E-01,  | 2.9338266E-01,  | 3.3137398E-01,  | DATA 503 |
| 518 |     | DATA (RCHOON 1), 1=325, 360, / |                 |                 |                 | DATA 504 |
| 519 | 541 | 3.5381300E-01,                 | 3.5843469E-01,  | 3.4405348E-01,  | 3.1084757E-01,  | DATA 505 |
| 520 | 542 | 2.6031223E-01,                 | 1.9504301E-01,  | 1.1841242E-01,  | 3.4357296E-02,  | DATA 506 |
| 521 | 543 | -5.2695652E-02,                | -1.3782722E-01, | -2.1568890E-01, | -2.8080228E-01, | DATA 507 |
| 522 | 544 | -3.2820424E-01,                | -3.5435079E-01, | -3.9791381E-01, | -3.4000455E-01, | DATA 508 |
| 523 | 545 | -3.0365416E-01,                | -2.5286235E-01, | -1.9171072E-01, | -1.2383727E-01, | DATA 509 |
| 524 | 546 | -5.2284436E-02,                | 2.0405561E-02,  | 9.1984621E-02,  | 1.4024804E-01,  | DATA 510 |
| 525 | 547 | 2.2282861E-01,                 | 2.7704811E-01,  | 3.1990704E-01,  | 3.4827312E-01,  | DATA 511 |
| 526 | 548 | 3.5930547E-01,                 | 3.5104477E-01,  | 3.2296060E-01,  | 2.7620297E-01,  | DATA 512 |
| 527 | 549 | 2.1344683E-01,                 | 1.3845154E-01,  | 5.5576428E-02,  | -3.056388E-02,  | DATA 513 |
| 528 |     | DATA (RCHOON 1), 1=361, 368, / |                 |                 |                 | DATA 514 |
| 529 | 551 | -1.1826024E-01,                | -1.9376047E-01, | -2.6134979E-01, | -3.1360475E-01, | DATA 515 |
| 530 | 552 | -3.4689607E-01,                | -3.5904177E-01, | -3.4981264E-01, | -3.2096634E-01, | DATA 516 |
| 531 |     | DATA (RCHOON 1), 1=369, 372, / |                 |                 |                 | DATA 516 |
| 532 | 561 | 5.6717946E 01,                 | 5.6832482E 01,  | 5.7139197E 01,  | 5.7649494E 01,  | DATA 517 |
| 533 | 562 | 5.8248008E 01,                 | 5.8902551E 01,  | 5.9570011E 01,  | 6.0220076E 01,  | DATA 518 |
| 534 | 563 | 6.0834532E 01,                 | 6.1404581E 01,  | 6.1926819E 01,  | 6.2399060E 01,  | DATA 519 |
| 535 | 564 | 6.2816763E 01,                 | 6.3170575E 01,  | 6.3445371E 01,  | 6.3620912E 01,  | DATA 520 |
| 536 | 565 | 6.3673907E 01,                 | 6.3981120E 01,  | 6.4332387E 01,  | 6.2888072E 01,  | DATA 521 |
| 537 | 566 | 6.2275904E 01,                 | 6.1501342E 01,  | 6.0596588E 01,  | 5.9612232E 01,  | DATA 522 |
| 538 | 567 | 5.8615814E 01,                 | 5.7687190E 01,  | 5.6909812E 01,  | 5.6359180E 01,  | DATA 523 |
| 539 | 568 | 5.6089321E 01,                 | 5.6122548E 01,  | 5.6445443E 01,  | 5.7012903E 01,  | DATA 524 |
| 540 | 569 | 5.7758578E 01,                 | 5.8608023E 01,  | 5.9490562E 01,  | 6.0347486E 01,  | DATA 525 |
| 541 |     | DATA (RCHOON 1), 1=373, 72, /  |                 |                 |                 | DATA 526 |
| 542 | 571 | 6.1135984E 01,                 | 6.1829397E 01,  | 6.2414896E 01,  | 6.2889792E 01,  | DATA 527 |
| 543 | 572 | 6.3257362E 01,                 | 6.3522768E 01,  | 6.3689578E 01,  | 6.3757459E 01,  | DATA 528 |
| 544 | 573 | 6.3721307E 01,                 | 6.3571816E 01,  | 6.3297327E 01,  | 6.2888019E 01,  | DATA 529 |
| 545 | 574 | 6.2333679E 01,                 | 6.1639785E 01,  | 6.0819501E 01,  | 5.9903044E 01,  | DATA 530 |
| 546 | 575 | 5.8938337E 01,                 | 5.7990283E 01,  | 5.7136399E 01,  | 5.6458152E 01,  | DATA 531 |
| 547 | 576 | 5.6028448E 01,                 | 5.5897765E 01,  | 5.6083206E 01,  | 5.6564511E 01,  | DATA 532 |
| 548 | 577 | 5.7288526E 01,                 | 5.8180322E 01,  | 5.9156925E 01,  | 6.0139626E 01,  | DATA 533 |
| 549 | 578 | 6.1062541E 01,                 | 6.1876963E 01,  | 6.2552132E 01,  | 6.3073662E 01,  | DATA 534 |
| 550 | 579 | 6.3440238E 01,                 | 6.3660001E 01,  | 6.3746363E 01,  | 6.3714169E 01,  | DATA 535 |
| 551 |     | DATA (RCHOON 1), 1=73, 108, /  |                 |                 |                 | DATA 536 |
| 552 | 581 | 6.3276577E 01,                 | 6.3342988E 01,  | 6.3018187E 01,  | 6.2602853E 01,  | DATA 537 |
| 553 | 582 | 6.2095525E 01,                 | 6.1495714E 01,  | 6.0807758E 01,  | 6.0044919E 01,  | DATA 538 |
| 554 | 583 | 5.9233072E 01,                 | 5.8412947E 01,  | 5.7639712E 01,  | 5.6978970E 01,  | DATA 539 |
| 555 | 584 | 5.6498771E 01,                 | 5.6258351E 01,  | 5.6296019E 01,  | 5.6619924E 01,  | DATA 540 |
| 556 | 585 | 5.7204994E 01,                 | 5.7997143E 01,  | 5.8923090E 01,  | 5.9902370E 01,  | DATA 541 |
| 557 | 586 | 6.0858288E 01,                 | 6.1725855E 01,  | 6.2456275E 01,  | 6.3018438E 01,  | DATA 542 |
| 558 | 587 | 6.3398211E 01,                 | 6.3596289E 01,  | 6.3625146E 01,  | 6.3505472E 01,  | DATA 543 |
| 559 | 588 | 6.3262382E 01,                 | 6.2921814E 01,  | 6.2507405E 01,  | 6.2038223E 01,  | DATA 544 |
| 560 | 589 | 6.1827779E 01,                 | 6.0984573E 01,  | 6.0414140E 01,  | 5.9822271E 01,  | DATA 545 |
| 561 |     | DATA (RCHOON 1), 1=109, 144, / |                 |                 |                 | DATA 546 |
| 562 | 591 | 5.9218868E 01,                 | 5.8621729E 01,  | 5.8058745E 01,  | 5.7563127E 01,  | DATA 547 |
| 563 | 592 | 5.7195226E 01,                 | 5.6986259E 01,  | 5.6979709E 01,  | 5.7197388E 01,  | DATA 548 |
| 564 | 593 | 5.7437880E 01,                 | 5.8274487E 01,  | 5.9058351E 01,  | 5.9925594E 01,  | DATA 549 |
| 565 | 594 | 6.0806297E 01,                 | 6.1633062E 01,  | 6.2347758E 01,  | 6.2965933E 01,  | DATA 550 |
| 566 | 595 | 6.3279029E 01,                 | 6.3434832E 01,  | 6.34436603E 01, | 6.3241166E 01,  | DATA 551 |
| 567 | 596 | 6.2896173E 01,                 | 6.2636688E 01,  | 6.1901292E 01,  | 6.1328004E 01,  | DATA 552 |
| 568 | 597 | 6.0750481E 01,                 | 6.0195162E 01,  | 5.9679908E 01,  | 5.9214939E 01,  | DATA 553 |



|     |                               |                |                |                |                |          |
|-----|-------------------------------|----------------|----------------|----------------|----------------|----------|
| 569 | 598                           | 5.8803162E 01, | 5.8447810E 01, | 5.8152396E 01, | 5.8925859E 01, | DATA 554 |
| 570 | 599                           | 5.7783426E 01, | 5.7745329E 01, | 5.7832977E 01, | 5.8063869E 01, | DATA 555 |
| 571 | DATA (RMOON (I)) I=145,180, / |                |                |                |                | DATA 556 |
| 572 | 601                           | 5.8443209E 01, | 5.8964445E 01, | 5.9602538E 01, | 6.0317928E 01, | DATA 557 |
| 573 | 602                           | 6.1060215E 01, | 6.1773923E 01, | 6.2404587E 01, | 6.2964133E 01, | DATA 558 |
| 574 | 603                           | 6.3235074E 01, | 6.3373348E 01, | 6.3309937E 01, | 6.3051327E 01, | DATA 559 |
| 575 | 604                           | 6.2618894E 01, | 6.2047224E 01, | 6.3381262E 01, | 6.0672298E 01, | DATA 560 |
| 576 | 605                           | 5.9972888E 01, | 5.9331234E 01, | 5.9785903E 01, | 5.8362039E 01, | DATA 561 |
| 577 | 606                           | 5.8070021E 01, | 5.7906998E 01, | 5.7860889E 01, | 5.7915700E 01, | DATA 562 |
| 578 | 607                           | 5.8056569E 01, | 5.9273185E 01, | 5.8960773E 01, | 5.8918619E 01, | DATA 563 |
| 579 | 608                           | 5.9346798E 01, | 5.9842160E 01, | 6.0394744E 01, | 6.0985602E 01, | DATA 564 |
| 580 | 609                           | 6.1386524E 01, | 6.2161695E 01, | 6.2670837E 01, | 6.3073264E 01, | DATA 565 |
| 581 | DATA (RMOON (I)) I=181,216, / |                |                |                |                | DATA 566 |
| 582 | 611                           | 6.3331587E 01, | 6.3416597E 01, | 6.3309584E 01, | 6.3005402E 01, | DATA 567 |
| 583 | 612                           | 6.2514052E 01, | 6.1061392E 01, | 6.1088578E 01, | 6.0249950E 01, | DATA 568 |
| 584 | 613                           | 5.9408898E 01, | 5.8631680E 01, | 5.7979619E 01, | 5.7500940E 01, | DATA 569 |
| 585 | 614                           | 5.7224143E 01, | 5.7154879E 01, | 5.7277397E 01, | 5.7560145E 01, | DATA 570 |
| 586 | 615                           | 5.7963673E 01, | 5.8443468E 01, | 5.8980779E 01, | 5.9535512E 01, | DATA 571 |
| 587 | 616                           | 5.0096229E 01, | 6.0652926E 01, | 6.1193628E 01, | 6.1725798E 01, | DATA 572 |
| 588 | 617                           | 6.2223413E 01, | 6.2675246E 01, | 6.8039635E 01, | 6.3350709E 01, | DATA 573 |
| 589 | 618                           | 6.3520796E 01, | 6.3545533E 01, | 6.3397483E 01, | 6.3069517E 01, | DATA 574 |
| 590 | 619                           | 6.2558316E 01, | 6.1877032E 01, | 6.1055189E 01, | 6.0139222E 01, | DATA 575 |
| 591 | DATA (RMOON (I)) I=217,252, / |                |                |                |                | DATA 576 |
| 592 | 621                           | 5.9190964E 01, | 5.8283391E 01, | 5.7493262E 01, | 5.6891053E 01, | DATA 577 |
| 593 | 622                           | 5.6529903E 01, | 5.6436453E 01, | 5.6606688E 01, | 5.7008360E 01, | DATA 578 |
| 594 | 623                           | 5.7589150E 01, | 5.8287631E 01, | 5.9043710E 01, | 5.9806201E 01, | DATA 579 |
| 595 | 624                           | 6.0536685E 01, | 6.1209990E 01, | 6.1812110E 01, | 6.2336794E 01, | DATA 580 |
| 596 | 625                           | 6.2781718E 01, | 6.3144949E 01, | 6.3422177E 01, | 6.3665154E 01, | DATA 581 |
| 597 | 626                           | 6.3681561E 01, | 6.3636133E 01, | 6.3452816E 01, | 6.3117801E 01, | DATA 582 |
| 598 | 627                           | 6.2623212E 01, | 6.1970942E 01, | 6.1176192E 01, | 6.0270236E 01, | DATA 583 |
| 599 | 628                           | 5.9301784E 01, | 5.8335928E 01, | 5.7449744E 01, | 5.6723962E 01, | DATA 584 |
| 600 | 629                           | 5.6231221E 01, | 5.6023089E 01, | 5.6119633E 01, | 5.6505311E 01, | DATA 585 |
| 601 | DATA (RMOON (I)) I=253,288, / |                |                |                |                | DATA 586 |
| 602 | 631                           | 5.7132870E 01, | 5.7933778E 01, | 5.8831367E 01, | 5.9752646E 01, | DATA 587 |
| 603 | 632                           | 6.0636493E 01, | 6.1437707E 01, | 6.2127537E 01, | 6.2691716E 01, | DATA 588 |
| 604 | 633                           | 6.3127096E 01, | 6.3437782E 01, | 6.3631274E 01, | 6.3715028E 01, | DATA 589 |
| 605 | 634                           | 6.3593938E 01, | 6.3569007E 01, | 6.3337244E 01, | 6.2992821E 01, | DATA 590 |
| 606 | 635                           | 6.2529554E 01, | 6.1944421E 01, | 6.1241569E 01, | 6.0436242E 01, | DATA 591 |
| 607 | 636                           | 5.9558093E 01, | 5.8653055E 01, | 5.7782624E 01, | 5.7019479E 01, | DATA 592 |
| 608 | 637                           | 5.6438927E 01, | 5.6106887E 01, | 5.6066897E 01, | 5.6330136E 01, | DATA 593 |
| 609 | 638                           | 5.6872113E 01, | 5.7637415E 01, | 5.8550686E 01, | 5.9529850E 01, | DATA 594 |
| 610 | 639                           | 6.0497731E 01, | 6.1390000E 01, | 6.2159286E 01, | 6.2776072E 01, | DATA 595 |
| 611 | DATA (RMOON (I)) I=289,324, / |                |                |                |                | DATA 596 |
| 612 | 641                           | 6.3227283E 01, | 6.3513442E 01, | 6.3645108E 01, | 6.3639045E 01, | DATA 597 |
| 613 | 642                           | 6.3514458E 01, | 6.3289674E 01, | 6.2979618E 01, | 6.2594398E 01, | DATA 598 |
| 614 | 643                           | 6.2139294E 01, | 6.1616272E 01, | 6.1026863E 01, | 6.0375887E 01, | DATA 599 |
| 615 | 644                           | 5.9675505E 01, | 5.8948856E 01, | 5.8232294E 01, | 5.7575061E 01, | DATA 600 |
| 616 | 645                           | 5.7035505E 01, | 5.6673521E 01, | 5.6340097E 01, | 5.6666303E 01, | DATA 601 |
| 617 | 646                           | 5.7055074E 01, | 5.7678710E 01, | 5.8483013E 01, | 5.9396511E 01, | DATA 602 |
| 618 | 647                           | 6.0341623E 01, | 6.1244776E 01, | 6.2043780E 01, | 6.2692185E 01, | DATA 603 |
| 619 | 648                           | 6.3161004E 01, | 6.3438384E 01, | 6.3527832E 01, | 6.3445464E 01, | DATA 604 |
| 620 | 649                           | 6.3216634E 01, | 6.2872163E 01, | 6.2444409E 01, | 6.1963557E 01, | DATA 605 |
| 621 | DATA (RMOON (I)) I=325,360, / |                |                |                |                | DATA 606 |
| 622 | 651                           | 6.1454629E 01, | 6.0935734E 01, | 6.0417922E 01, | 5.9906771E 01, | DATA 607 |
| 623 | 652                           | 5.9405479E 01, | 5.8918896E 01, | 5.8457556E 01, | 5.8040580E 01, | DATA 608 |
| 624 | 653                           | 5.7896354E 01, | 5.7460292E 01, | 5.7369524E 01, | 5.7455339E 01, | DATA 609 |
| 625 | 654                           | 5.7735142E 01, | 5.8206299E 01, | 5.8843828E 01, | 5.9662425E 01, | DATA 610 |
| 626 | 655                           | 6.0423454E 01, | 6.1240838E 01, | 6.1990886E 01, | 6.2617903E 01, | DATA 611 |
| 627 | 656                           | 6.3078893E 01, | 6.3346316E 01, | 6.3409169E 01, | 6.3272703E 01, | DATA 612 |
| 628 | 657                           | 6.2957029E 01, | 6.2494726E 01, | 6.1927512E 01, | 6.1302033E 01, | DATA 613 |
| 629 | 658                           | 6.0465029E 01, | 6.0058367E 01, | 5.9514774E 01, | 5.9055136E 01, | DATA 614 |
| 630 | 659                           | 5.8688117E 01, | 5.8412266E 01, | 5.8220148E 01, | 5.8103365E 01, | DATA 615 |
| 631 | DATA (RMOON (I)) I=361,368, / |                |                |                |                | DATA 616 |
| 632 | 661                           | 5.8057084E 01, | 5.8052806E 01, | 5.8188573E 01, | 5.8386496E 01, | DATA 617 |
| 633 | 662                           | 5.8688202E 01, | 5.9099398E 01, | 5.9615105E 01, | 6.0216896E 01, | DATA 618 |
| 634 | END                           |                |                |                |                | DATA 619 |

29748 WORDS OF MEMORY USED BY THIS COMPILATION



|     |     |                               |                |                |                |      |     |   |
|-----|-----|-------------------------------|----------------|----------------|----------------|------|-----|---|
| 43  | 37  | 2.6246177E-01,                | 2.7842552E-01, | 2.9440377E-01, | 3.1039750E-01, | DATA | 33  |   |
| 44  | 38  | 3.2640815E-01,                | 3.4243703E-01, | 3.5848538E-01, | 3.7455502E-01, | DATA | 34  |   |
| 45  | 39  | 3.9064723E-01,                | 4.0676376E-01, | 4.2290623E-01, | 4.3907620E-01, | DATA | 35  |   |
| 46  |     | DATA (RASUN (1), I=109, 144), |                |                |                | DATA | 36  | 6 |
| 47  | 41  | 4.5327477E-01,                | 4.7150316E-01, | 4.8776244E-01, | 5.0405379E-01, | DATA | 37  |   |
| 48  | 42  | 5.2037794E-01,                | 5.3673584E-01, | 5.5312826E-01, | 5.6955601E-01, | DATA | 38  |   |
| 49  | 43  | 5.8601979E-01,                | 6.0252022E-01, | 6.1905788E-01, | 6.3563324E-01, | DATA | 39  |   |
| 50  | 44  | 6.5224671E-01,                | 6.6889806E-01, | 6.8558933E-01, | 7.0231902E-01, | DATA | 40  |   |
| 51  | 45  | 7.1908785E-01,                | 7.3589592E-01, | 7.5274332E-01, | 7.6963005E-01, | DATA | 41  |   |
| 52  | 46  | 7.8655639E-01,                | 8.0352256E-01, | 8.2052882E-01, | 8.3757524E-01, | DATA | 42  |   |
| 53  | 47  | 8.5466246E-01,                | 8.7179093E-01, | 8.8896082E-01, | 9.0617249E-01, | DATA | 43  |   |
| 54  | 48  | 9.2342588E-01,                | 9.4072092E-01, | 9.5805751E-01, | 9.7543564E-01, | DATA | 44  |   |
| 55  | 49  | 9.9285478E-01,                | 1.0103145E 00, | 1.0278144E 00, | 1.0453538E 00, | DATA | 45  |   |
| 56  |     | DATA (RASUN (1), I=145, 180), |                |                |                | DATA | 46  | 6 |
| 57  | 51  | 1.0629321E 00,                | 1.0805484E 00, | 1.0982019E 00, | 1.1158916E 00, | DATA | 47  |   |
| 58  | 52  | 1.1336163E 00,                | 1.1513748E 00, | 1.1691638E 00, | 1.1869880E 00, | DATA | 48  |   |
| 59  | 53  | 1.2048399E 00,                | 1.2227200E 00, | 1.2406266E 00, | 1.2585583E 00, | DATA | 49  |   |
| 60  | 54  | 1.2765137E 00,                | 1.2944914E 00, | 1.3124900E 00, | 1.3305080E 00, | DATA | 50  |   |
| 61  | 55  | 1.3485445E 00,                | 1.3665982E 00, | 1.3846681E 00, | 1.4027525E 00, | DATA | 51  |   |
| 62  | 56  | 1.4208503E 00,                | 1.4389601E 00, | 1.4570803E 00, | 1.4752102E 00, | DATA | 52  |   |
| 63  | 57  | 1.4933475E 00,                | 1.5114911E 00, | 1.5296392E 00, | 1.5477905E 00, | DATA | 53  |   |
| 64  | 58  | 1.5659431E 00,                | 1.5840953E 00, | 1.6022454E 00, | 1.6203916E 00, | DATA | 54  |   |
| 65  | 59  | 1.638531E 00,                 | 1.6566642E 00, | 1.6747868E 00, | 1.6928976E 00, | DATA | 55  |   |
| 66  |     | DATA (RASUN (1), I=181, 216), |                |                |                | DATA | 56  | 6 |
| 67  | 61  | 1.7109946E 00,                | 1.7290757E 00, | 1.7471390E 00, | 1.7651824E 00, | DATA | 57  |   |
| 68  | 62  | 1.7832045E 00,                | 1.8012035E 00, | 1.8191779E 00, | 1.8371263E 00, | DATA | 58  |   |
| 69  | 63  | 1.8550474E 00,                | 1.8729402E 00, | 1.8908035E 00, | 1.9086361E 00, | DATA | 59  |   |
| 70  | 64  | 1.9264371E 00,                | 1.9442054E 00, | 1.9619404E 00, | 1.9796412E 00, | DATA | 60  |   |
| 71  | 65  | 1.9973072E 00,                | 2.0149374E 00, | 2.0325313E 00, | 2.0500883E 00, | DATA | 61  |   |
| 72  | 66  | 2.0676076E 00,                | 2.0850886E 00, | 2.1025307E 00, | 2.1199330E 00, | DATA | 62  |   |
| 73  | 67  | 2.1372951E 00,                | 2.1546161E 00, | 2.1718953E 00, | 2.1891322E 00, | DATA | 63  |   |
| 74  | 68  | 2.2063260E 00,                | 2.2234760E 00, | 2.2405817E 00, | 2.2576425E 00, | DATA | 64  |   |
| 75  | 69  | 2.2746502E 00,                | 2.2916287E 00, | 2.3085537E 00, | 2.3254332E 00, | DATA | 65  |   |
| 76  |     | DATA (RASUN (1), I=217, 252), |                |                |                | DATA | 66  | 6 |
| 77  | 71  | 2.3422675E 00,                | 2.3590567E 00, | 2.3758012E 00, | 2.3925012E 00, | DATA | 67  |   |
| 78  | 72  | 2.4091572E 00,                | 2.4257700E 00, | 2.4423400E 00, | 2.4588682E 00, | DATA | 68  |   |
| 79  | 73  | 2.4753553E 00,                | 2.4918021E 00, | 2.5082076E 00, | 2.5245787E 00, | DATA | 69  |   |
| 80  | 74  | 2.5409102E 00,                | 2.5572051E 00, | 2.5734640E 00, | 2.5896880E 00, | DATA | 70  |   |
| 81  | 75  | 2.6058778E 00,                | 2.6220341E 00, | 2.6381577E 00, | 2.6542496E 00, | DATA | 71  |   |
| 82  | 76  | 2.6703102E 00,                | 2.6863402E 00, | 2.7023403E 00, | 2.7183114E 00, | DATA | 72  |   |
| 83  | 77  | 2.7342544E 00,                | 2.7501703E 00, | 2.7660598E 00, | 2.7819239E 00, | DATA | 73  |   |
| 84  | 78  | 2.7977638E 00,                | 2.8135807E 00, | 2.8293738E 00, | 2.8451502E 00, | DATA | 74  |   |
| 85  | 79  | 2.8609053E 00,                | 2.8766427E 00, | 2.8923638E 00, | 2.9080704E 00, | DATA | 75  |   |
| 86  |     | DATA (RASUN (1), I=253, 288), |                |                |                | DATA | 76  | 6 |
| 87  | 81  | 2.9237641E 00,                | 2.9394466E 00, | 2.9551194E 00, | 2.9707843E 00, | DATA | 77  |   |
| 88  | 82  | 2.9864430E 00,                | 3.0020969E 00, | 3.0177477E 00, | 3.0333969E 00, | DATA | 78  |   |
| 89  | 83  | 3.0490460E 00,                | 3.0646964E 00, | 3.0803036E 00, | 3.0960070E 00, | DATA | 79  |   |
| 90  | 84  | 3.1116697E 00,                | 3.1273391E 00, | 3.1430164E 00, | 3.1587029E 00, | DATA | 80  |   |
| 91  | 85  | 3.1743999E 00,                | 3.1901086E 00, | 3.2058302E 00, | 3.2215657E 00, | DATA | 81  |   |
| 92  | 86  | 3.2373165E 00,                | 3.2530840E 00, | 3.2688694E 00, | 3.2846740E 00, | DATA | 82  |   |
| 93  | 87  | 3.3004995E 00,                | 3.3163474E 00, | 3.3322195E 00, | 3.3481174E 00, | DATA | 83  |   |
| 94  | 88  | 3.3640428E 00,                | 3.3799976E 00, | 3.3959833E 00, | 3.4120017E 00, | DATA | 84  |   |
| 95  | 89  | 3.4280545E 00,                | 3.4441431E 00, | 3.4602691E 00, | 3.4764341E 00, | DATA | 85  |   |
| 96  |     | DATA (RASUN (1), I=289, 324), |                |                |                | DATA | 86  | 6 |
| 97  | 91  | 3.4926395E 00,                | 3.5088866E 00, | 3.5251768E 00, | 3.5415114E 00, | DATA | 87  |   |
| 98  | 92  | 3.5578914E 00,                | 3.5743180E 00, | 3.5907923E 00, | 3.6073155E 00, | DATA | 88  |   |
| 99  | 93  | 3.6238802E 00,                | 3.6405113E 00, | 3.6571855E 00, | 3.6739111E 00, | DATA | 89  |   |
| 100 | 94  | 3.6906891E 00,                | 3.7075199E 00, | 3.7244042E 00, | 3.7413425E 00, | DATA | 90  |   |
| 101 | 95  | 3.7583357E 00,                | 3.7753847E 00, | 3.7924903E 00, | 3.8096534E 00, | DATA | 91  |   |
| 102 | 96  | 3.8268748E 00,                | 3.8441554E 00, | 3.8614958E 00, | 3.8788968E 00, | DATA | 92  |   |
| 103 | 97  | 3.8963589E 00,                | 3.9138826E 00, | 3.9314684E 00, | 3.9491166E 00, | DATA | 93  |   |
| 104 | 98  | 3.9668276E 00,                | 3.9846013E 00, | 4.0024380E 00, | 4.0203376E 00, | DATA | 94  |   |
| 105 | 99  | 4.0383000E 00,                | 4.0563247E 00, | 4.0744117E 00, | 4.0925605E 00, | DATA | 95  |   |
| 106 |     | DATA (RASUN (1), I=325, 360), |                |                |                | DATA | 96  | 6 |
| 107 | 101 | 4.1107704E 00,                | 4.1290403E 00, | 4.1473691E 00, | 4.1657557E 00, | DATA | 97  |   |
| 108 | 102 | 4.1841987E 00,                | 4.2026968E 00, | 4.2212484E 00, | 4.2398522E 00, | DATA | 98  |   |
| 109 | 103 | 4.2585070E 00,                | 4.2772114E 00, | 4.2959644E 00, | 4.3147646E 00, | DATA | 99  |   |
| 110 | 104 | 4.3336107E 00,                | 4.3525013E 00, | 4.3714330E 00, | 4.3904102E 00, | DATA | 100 |   |
| 111 | 105 | 4.4094254E 00,                | 4.4284790E 00, | 4.4475691E 00, | 4.4666941E 00, | DATA | 101 |   |
| 112 | 106 | 4.4858521E 00,                | 4.5050411E 00, | 4.5242592E 00, | 4.5435044E 00, | DATA | 102 |   |
| 113 | 107 | 4.5627745E 00,                | 4.5820674E 00, | 4.6013810E 00, | 4.6207131E 00, | DATA | 103 |   |
| 114 | 108 | 4.6400610E 00,                | 4.6594219E 00, | 4.6787930E 00, | 4.6981715E 00, | DATA | 104 |   |
| 115 | 109 | 4.7175543E 00,                | 4.7369389E 00, | 4.7563211E 00, | 4.7756990E 00, | DATA | 105 |   |
| 116 |     | DATA (RASUN (1), I=361, 368), |                |                |                | DATA | 106 | 6 |



|     |                               |                 |                 |                 |                 |          |
|-----|-------------------------------|-----------------|-----------------|-----------------|-----------------|----------|
| 117 | 111                           | 4.7950698E 00,  | 4.8144310E 00,  | 4.8337801E 00,  | 4.8531146E 00,  | DATA 107 |
| 118 | 112                           | 4.8724324E 00,  | 4.8917311E 00,  | 4.9110095E 00,  | 4.9302626E 00,  | DATA 108 |
| 119 | DATA (BCSUN (I),I= 1, 35)/    |                 |                 |                 |                 | DATA 109 |
| 120 | 121                           | -4.0416246E-01, | -4.0293380E-01, | -4.0157101E-01, | -4.0067477E-01, | DATA 109 |
| 121 | 122                           | -3.9844581E-01, | -3.9668502E-01, | -3.9479319E-01, | -3.9277130E-01, | DATA 110 |
| 122 | 123                           | -3.9062032E-01, | -3.8834138E-01, | -3.8593556E-01, | -3.8340103E-01, | DATA 111 |
| 123 | 124                           | -3.8074806E-01, | -3.7795891E-01, | -3.7506790E-01, | -3.7204637E-01, | DATA 112 |
| 124 | 125                           | -3.6890578E-01, | -3.6364755E-01, | -3.6227303E-01, | -3.5878370E-01, | DATA 113 |
| 125 | 126                           | -3.5518106E-01, | -3.5145662E-01, | -3.4764200E-01, | -3.4370881E-01, | DATA 114 |
| 126 | 127                           | -3.3966872E-01, | -3.3552359E-01, | -3.3127527E-01, | -3.2692566E-01, | DATA 115 |
| 127 | 128                           | -3.2247670E-01, | -3.1793033E-01, | -3.1328854E-01, | -3.0855329E-01, | DATA 116 |
| 128 | 129                           | -3.0372664E-01, | -2.9881052E-01, | -2.9380695E-01, | -2.8871791E-01, | DATA 117 |
| 129 | DATA (BCSUN (I),I= 37, 72)/   |                 |                 |                 |                 | DATA 118 |
| 130 | 131                           | -2.6354548E-01, | -2.7829167E-01, | -2.7295849E-01, | -2.6754789E-01, | DATA 119 |
| 131 | 132                           | -2.6206202E-01, | -2.5650284E-01, | -2.5087238E-01, | -2.4517263E-01, | DATA 120 |
| 132 | 133                           | -2.3940568E-01, | -2.3357337E-01, | -2.2767765E-01, | -2.2172040E-01, | DATA 121 |
| 133 | 134                           | -2.1570351E-01, | -2.0962881E-01, | -2.0349820E-01, | -1.9731361E-01, | DATA 122 |
| 134 | 135                           | -1.9107681E-01, | -1.8478993E-01, | -1.7845502E-01, | -1.7207408E-01, | DATA 123 |
| 135 | 136                           | -1.6564918E-01, | -1.5918239E-01, | -1.5267574E-01, | -1.4615505E-01, | DATA 124 |
| 136 | 137                           | -1.3293701E-01, | -1.2629117E-01, | -1.1961550E-01, | -1.1291199E-01, | DATA 125 |
| 137 | 138                           | -1.0618257E-01, | -9.9429179E-02, | -9.2653743E-02, | -8.5858164E-02, | DATA 126 |
| 138 | 139                           | -7.9044326E-02, | -7.2214111E-02, | -6.5369374E-02, | -5.8512020E-02, | DATA 127 |
| 139 | DATA (BCSUN (I),I= 73, 108)/  |                 |                 |                 |                 | DATA 128 |
| 140 | 141                           | -5.1643759E-02, | -4.4766332E-02, | -3.7881439E-02, | -3.0990780E-02, | DATA 129 |
| 141 | 142                           | -2.4095958E-02, | -1.7198594E-02, | -1.0300320E-02, | -3.4027158E-03, | DATA 130 |
| 142 | 143                           | 3.4923991E-03,  | 1.0383260E-02,  | 1.7268076E-02,  | 2.4145091E-02,  | DATA 131 |
| 143 | 144                           | 3.1012462E-02,  | 3.7968384E-02,  | 4.4711070E-02,  | 5.1538729E-02,  | DATA 132 |
| 144 | 145                           | 5.8349602E-02,  | 6.5141924E-02,  | 7.1913932E-02,  | 7.8663872E-02,  | DATA 133 |
| 145 | 146                           | 8.5389993E-02,  | 9.2090563E-02,  | 9.8763831E-02,  | 1.0540814E-01,  | DATA 134 |
| 146 | 147                           | 1.1202171E-01,  | 1.1860286E-01,  | 1.2514989E-01,  | 1.3166105E-01,  | DATA 135 |
| 147 | 148                           | 1.3813475E-01,  | 1.4456938E-01,  | 1.5096335E-01,  | 1.5731504E-01,  | DATA 136 |
| 148 | 149                           | 1.6362305E-01,  | 1.6988585E-01,  | 1.7610199E-01,  | 1.8226998E-01,  | DATA 137 |
| 149 | DATA (BCSUN (I),I= 109, 144)/ |                 |                 |                 |                 | DATA 138 |
| 150 | 151                           | 1.8838820E-01,  | 1.9445505E-01,  | 2.0046893E-01,  | 2.0642822E-01,  | DATA 139 |
| 151 | 152                           | 2.1233124E-01,  | 2.1817633E-01,  | 2.2396186E-01,  | 2.2968620E-01,  | DATA 140 |
| 152 | 153                           | 2.3534775E-01,  | 2.4094489E-01,  | 2.4647601E-01,  | 2.5193948E-01,  | DATA 141 |
| 153 | 154                           | 2.5733375E-01,  | 2.6263722E-01,  | 2.6790829E-01,  | 2.7308547E-01,  | DATA 142 |
| 154 | 155                           | 2.7818711E-01,  | 2.8321169E-01,  | 2.8815766E-01,  | 2.9302350E-01,  | DATA 143 |
| 155 | 156                           | 2.9780769E-01,  | 3.0250875E-01,  | 3.0712531E-01,  | 3.1165592E-01,  | DATA 144 |
| 156 | 157                           | 3.1609928E-01,  | 3.2045411E-01,  | 3.2471912E-01,  | 3.2889301E-01,  | DATA 145 |
| 157 | 158                           | 3.3297450E-01,  | 3.3696223E-01,  | 3.4085495E-01,  | 3.4465136E-01,  | DATA 146 |
| 158 | 159                           | 3.4835008E-01,  | 3.5194991E-01,  | 3.5544936E-01,  | 3.5884787E-01,  | DATA 147 |
| 159 | DATA (BCSUN (I),I= 145, 180)/ |                 |                 |                 |                 | DATA 148 |
| 160 | 161                           | 3.6214364E-01,  | 3.6533571E-01,  | 3.6842301E-01,  | 3.7140445E-01,  | DATA 149 |
| 161 | 162                           | 3.7427897E-01,  | 3.7704556E-01,  | 3.7970323E-01,  | 3.8225106E-01,  | DATA 150 |
| 162 | 163                           | 3.8468809E-01,  | 3.8701344E-01,  | 3.8922624E-01,  | 3.9132570E-01,  | DATA 151 |
| 163 | 164                           | 3.9331098E-01,  | 3.9518137E-01,  | 3.9693619E-01,  | 3.9857484E-01,  | DATA 152 |
| 164 | 165                           | 4.0009676E-01,  | 4.0150147E-01,  | 4.0278850E-01,  | 4.0395739E-01,  | DATA 153 |
| 165 | 166                           | 4.0500775E-01,  | 4.0593921E-01,  | 4.0675139E-01,  | 4.0744400E-01,  | DATA 154 |
| 166 | 167                           | 4.0901673E-01,  | 4.0846938E-01,  | 4.0880179E-01,  | 4.0901388E-01,  | DATA 155 |
| 167 | 168                           | 4.0910557E-01,  | 4.0907690E-01,  | 4.0892795E-01,  | 4.0865885E-01,  | DATA 156 |
| 168 | 169                           | 4.0826974E-01,  | 4.0776093E-01,  | 4.0713264E-01,  | 4.0638521E-01,  | DATA 157 |
| 169 | DATA (BCSUN (I),I= 181, 216)/ |                 |                 |                 |                 | DATA 158 |
| 170 | 171                           | 4.0851905E-01,  | 4.0453448E-01,  | 4.0343202E-01,  | 4.0221216E-01,  | DATA 159 |
| 171 | 172                           | 4.0087536E-01,  | 3.9942215E-01,  | 3.9785322E-01,  | 3.9616916E-01,  | DATA 160 |
| 172 | 173                           | 3.9437074E-01,  | 3.9245864E-01,  | 3.9043362E-01,  | 3.8829650E-01,  | DATA 161 |
| 173 | 174                           | 3.8604810E-01,  | 3.8368920E-01,  | 3.8122066E-01,  | 3.7864332E-01,  | DATA 162 |
| 174 | 175                           | 3.7595807E-01,  | 3.7316592E-01,  | 3.7026782E-01,  | 3.6726483E-01,  | DATA 163 |
| 175 | 176                           | 3.6415802E-01,  | 3.6094853E-01,  | 3.5763756E-01,  | 3.5422627E-01,  | DATA 164 |
| 176 | 177                           | 3.5071596E-01,  | 3.4710789E-01,  | 3.4340338E-01,  | 3.3960378E-01,  | DATA 165 |
| 177 | 178                           | 3.3571045E-01,  | 3.3172478E-01,  | 3.2764815E-01,  | 3.2348199E-01,  | DATA 166 |
| 178 | 179                           | 3.1927262E-01,  | 3.1488651E-01,  | 3.1046000E-01,  | 3.0594966E-01,  | DATA 167 |
| 179 | DATA (BCSUN (I),I= 217, 252)/ |                 |                 |                 |                 | DATA 168 |
| 180 | 181                           | 3.0135681E-01,  | 2.9668292E-01,  | 2.9192939E-01,  | 2.8709770E-01,  | DATA 169 |
| 181 | 182                           | 2.8218920E-01,  | 2.7720530E-01,  | 2.7214739E-01,  | 2.6701677E-01,  | DATA 170 |
| 182 | 183                           | 2.6181490E-01,  | 2.5654316E-01,  | 2.5120302E-01,  | 2.4579587E-01,  | DATA 171 |
| 183 | 184                           | 2.4032325E-01,  | 2.3478657E-01,  | 2.2918743E-01,  | 2.2352734E-01,  | DATA 172 |
| 184 | 185                           | 2.1780785E-01,  | 2.1203057E-01,  | 2.0619712E-01,  | 2.0030904E-01,  | DATA 173 |
| 185 | 186                           | 1.9433680E-01,  | 1.8837377E-01,  | 1.8233382E-01,  | 1.7624385E-01,  | DATA 174 |
| 186 | 187                           | 1.7010747E-01,  | 1.6392628E-01,  | 1.5770189E-01,  | 1.5143602E-01,  | DATA 175 |
| 187 | 188                           | 1.4513015E-01,  | 1.3878589E-01,  | 1.3240481E-01,  | 1.2598847E-01,  | DATA 176 |
| 188 | 189                           | 1.1953839E-01,  | 1.1305605E-01,  | 1.0654292E-01,  | 1.0000049E-01,  | DATA 177 |
| 189 | DATA (BCSUN (I),I= 253, 288)/ |                 |                 |                 |                 | DATA 178 |
| 190 | 191                           | 9.3430127E-02,  | 8.6833426E-02,  | 8.0211850E-02,  | 7.3566879E-02,  | DATA 179 |



|     |     |                               |                 |                 |                 |          |
|-----|-----|-------------------------------|-----------------|-----------------|-----------------|----------|
| 191 | 192 | 6.6900062E=02,                | 6.0212947E=02,  | 5.8907100E=02,  | 4.6784097E=02,  | DATA 180 |
| 192 | 193 | 4.0045565E=02,                | 3.3293148E=02,  | 2.4528500E=02,  | 1.9753262E=02,  | DATA 181 |
| 193 | 194 | 1.2969207E=02,                | 6.1780630E=03,  | 6.1845110E=04,  | 7.4186466E=03,  | DATA 182 |
| 194 | 195 | -1.4220764E=02,               | -2.1023067E=02, | -2.7823804E=02, | -3.4621136E=02, | DATA 183 |
| 195 | 196 | -4.1413398E=02,               | -4.8198852E=02, | -5.4975755E=02, | -6.1742341E=02, | DATA 184 |
| 196 | 197 | -6.8496950E=02,               | -7.5237912E=02, | -8.1963570E=02, | -8.8672278E=02, | DATA 185 |
| 197 | 198 | -9.5362374E=02,               | -1.0203218E=01, | -1.0868003E=01, | -1.4530422E=01, | DATA 186 |
| 198 | 199 | -1.2190301E=01,               | -1.2847468E=01, | -1.3501744E=01, | -1.4152953E=01, | DATA 187 |
| 199 |     | DATA (BCSUN (I), I=289, 324)/ |                 |                 |                 | DATA 188 |
| 200 | 201 | -1.4800911E=01,               | -1.5445436E=01, | -1.6086339E=01, | -1.6723434E=01, | DATA 189 |
| 201 | 202 | -1.7356524E=01,               | -1.7983416E=01, | -1.8609914E=01, | -1.9229832E=01, | DATA 190 |
| 202 | 203 | -1.9844969E=01,               | -2.0455122E=01, | -2.1060097E=01, | -2.1659689E=01, | DATA 191 |
| 203 | 204 | -2.2253699E=01,               | -2.2841927E=01, | -2.3424171E=01, | -2.4000227E=01, | DATA 192 |
| 204 | 205 | -2.4569903E=01,               | -2.5133004E=01, | -2.5689338E=01, | -2.6238710E=01, | DATA 193 |
| 205 | 206 | -2.6780938E=01,               | -2.7315828E=01, | -2.7843188E=01, | -2.8362833E=01, | DATA 194 |
| 206 | 207 | -2.8874568E=01,               | -2.9378203E=01, | -2.9873550E=01, | -3.0360414E=01, | DATA 195 |
| 207 | 208 | -3.0838606E=01,               | -3.1307930E=01, | -3.1768201E=01, | -3.2219217E=01, | DATA 196 |
| 208 | 209 | -3.2660792E=01,               | -3.3092737E=01, | -3.3514839E=01, | -3.3926985E=01, | DATA 197 |
| 209 |     | DATA (BCSUN (I), I=325, 360)/ |                 |                 |                 | DATA 198 |
| 210 | 211 | -3.4328923E=01,               | -3.4720497E=01, | -3.5101526E=01, | -3.5471840E=01, | DATA 199 |
| 211 | 212 | -3.5831261E=01,               | -3.6179617E=01, | -3.6516736E=01, | -3.6842454E=01, | DATA 200 |
| 212 | 213 | -3.7156609E=01,               | -3.7459051E=01, | -3.7749630E=01, | -3.8022204E=01, | DATA 201 |
| 213 | 214 | -3.8294642E=01,               | -3.8549804E=01, | -3.8790375E=01, | -3.9019824E=01, | DATA 202 |
| 214 | 215 | -3.9236440E=01,               | -3.9440308E=01, | -3.9631320E=01, | -3.9809379E=01, | DATA 203 |
| 215 | 216 | -3.9974387E=01,               | -4.0126247E=01, | -4.0264878E=01, | -4.0390198E=01, | DATA 204 |
| 216 | 217 | -4.0502129E=01,               | -4.0600610E=01, | -4.0695578E=01, | -4.0756986E=01, | DATA 205 |
| 217 | 218 | -4.0814798E=01,               | -4.0858978E=01, | -4.0889503E=01, | -4.0906360E=01, | DATA 206 |
| 218 | 219 | -4.0909531E=01,               | -4.0899017E=01, | -4.0874809E=01, | -4.0836918E=01, | DATA 207 |
| 219 |     | DATA (BCSUN (I), I=361, 368)/ |                 |                 |                 | DATA 208 |
| 220 | 221 | -4.0785358E=01,               | -4.0720147E=01, | -4.0641317E=01, | -4.0548902E=01, | DATA 209 |
| 221 | 222 | -4.0442950E=01,               | -4.0323514E=01, | -4.0190355E=01, | -4.0044433E=01, | DATA 210 |
| 222 |     | DATA (RSUN (I), I=1, 36)/     |                 |                 |                 | DATA 210 |
| 223 | 231 | 9.8400871E=01,                | 9.8399358E=01,  | 9.8398222E=01,  | 9.8397464E=01,  | DATA 211 |
| 224 | 232 | 9.8397081E=01,                | 9.8397094E=01,  | 9.8397519E=01,  | 9.8398376E=01,  | DATA 212 |
| 225 | 233 | 9.8399688E=01,                | 9.8401473E=01,  | 9.8403756E=01,  | 9.8406559E=01,  | DATA 213 |
| 226 | 234 | 9.8409899E=01,                | 9.8413804E=01,  | 9.8418297E=01,  | 9.8423397E=01,  | DATA 214 |
| 227 | 235 | 9.8429127E=01,                | 9.8435488E=01,  | 9.8442486E=01,  | 9.8450118E=01,  | DATA 215 |
| 228 | 236 | 9.8458398E=01,                | 9.8467284E=01,  | 9.8476750E=01,  | 9.8486761E=01,  | DATA 216 |
| 229 | 237 | 9.8497286E=01,                | 9.8508292E=01,  | 9.8519741E=01,  | 9.8531601E=01,  | DATA 217 |
| 230 | 238 | 9.8543826E=01,                | 9.8556411E=01,  | 9.8569338E=01,  | 9.8582594E=01,  | DATA 218 |
| 231 | 239 | 9.8596162E=01,                | 9.8610049E=01,  | 9.8624261E=01,  | 9.8638804E=01,  | DATA 219 |
| 232 |     | DATA (RSUN (I), I=37, 72)/    |                 |                 |                 | DATA 220 |
| 233 | 241 | 9.8653368E=01,                | 9.8668921E=01,  | 9.8684525E=01,  | 9.8700511E=01,  | DATA 221 |
| 234 | 242 | 9.8716896E=01,                | 9.8733702E=01,  | 9.8750953E=01,  | 9.8768668E=01,  | DATA 222 |
| 235 | 243 | 9.8786865E=01,                | 9.8803561E=01,  | 9.8824766E=01,  | 9.8844489E=01,  | DATA 223 |
| 236 | 244 | 9.8864753E=01,                | 9.8883519E=01,  | 9.8906760E=01,  | 9.8928452E=01,  | DATA 224 |
| 237 | 245 | 9.8950566E=01,                | 9.8973061E=01,  | 9.8995897E=01,  | 9.9019034E=01,  | DATA 225 |
| 238 | 246 | 9.9042422E=01,                | 9.9066041E=01,  | 9.9089869E=01,  | 9.9138047E=01,  | DATA 226 |
| 239 | 247 | 9.9162366E=01,                | 9.9186828E=01,  | 9.9211428E=01,  | 9.9236166E=01,  | DATA 227 |
| 240 | 248 | 9.9261043E=01,                | 9.9286068E=01,  | 9.9311250E=01,  | 9.9336594E=01,  | DATA 228 |
| 241 | 249 | 9.9362120E=01,                | 9.9387849E=01,  | 9.9413801E=01,  | 9.9439985E=01,  | DATA 229 |
| 242 |     | DATA (RSUN (I), I=73, 108)/   |                 |                 |                 | DATA 230 |
| 243 | 251 | 9.9466427E=01,                | 9.9493150E=01,  | 9.9520168E=01,  | 9.9547512E=01,  | DATA 231 |
| 244 | 252 | 9.9575156E=01,                | 9.9603082E=01,  | 9.9631273E=01,  | 9.9659719E=01,  | DATA 232 |
| 245 | 253 | 9.9688370E=01,                | 9.9717186E=01,  | 9.9746124E=01,  | 9.9775133E=01,  | DATA 233 |
| 246 | 254 | 9.9804190E=01,                | 9.9833261E=01,  | 9.9862318E=01,  | 9.9891324E=01,  | DATA 234 |
| 247 | 255 | 9.9920268E=01,                | 9.9949130E=01,  | 9.9977899E=01,  | 1.0006656E=00,  | DATA 235 |
| 248 | 256 | 1.0003512E=00,                | 1.0006356E=00,  | 1.0009190E=00,  | 1.0012013E=00,  | DATA 236 |
| 249 | 257 | 1.0014827E=00,                | 1.0017633E=00,  | 1.0020433E=00,  | 1.0023228E=00,  | DATA 237 |
| 250 | 258 | 1.0026021E=00,                | 1.0028814E=00,  | 1.0031610E=00,  | 1.0034413E=00,  | DATA 238 |
| 251 | 259 | 1.0037220E=00,                | 1.0040033E=00,  | 1.0042850E=00,  | 1.0045672E=00,  | DATA 239 |
| 252 |     | DATA (RSUN (I), I=109, 144)/  |                 |                 |                 | DATA 240 |
| 253 | 261 | 1.0048495E=00,                | 1.0051315E=00,  | 1.0054128E=00,  | 1.0056929E=00,  | DATA 241 |
| 254 | 262 | 1.0059716E=00,                | 1.0062486E=00,  | 1.0065234E=00,  | 1.0067957E=00,  | DATA 242 |
| 255 | 263 | 1.0070653E=00,                | 1.0073321E=00,  | 1.0075957E=00,  | 1.0078560E=00,  | DATA 243 |
| 256 | 264 | 1.0081130E=00,                | 1.0083635E=00,  | 1.0086164E=00,  | 1.0088629E=00,  | DATA 244 |
| 257 | 265 | 1.0091059E=00,                | 1.0093456E=00,  | 1.0095821E=00,  | 1.0098155E=00,  | DATA 245 |
| 258 | 266 | 1.0100461E=00,                | 1.0102742E=00,  | 1.0105002E=00,  | 1.0107242E=00,  | DATA 246 |
| 259 | 267 | 1.0109464E=00,                | 1.0111669E=00,  | 1.0113858E=00,  | 1.0116033E=00,  | DATA 247 |
| 260 | 268 | 1.0118191E=00,                | 1.0120329E=00,  | 1.0122444E=00,  | 1.0124534E=00,  | DATA 248 |
| 261 | 269 | 1.0126594E=00,                | 1.0128622E=00,  | 1.0130614E=00,  | 1.0132567E=00,  | DATA 249 |
| 262 |     | DATA (RSUN (I), I=145, 180)/  |                 |                 |                 | DATA 250 |
| 263 | 271 | 1.0134478E=00,                | 1.0136345E=00,  | 1.0138166E=00,  | 1.0139938E=00,  | DATA 251 |
| 264 | 272 | 1.0141659E=00,                | 1.0143330E=00,  | 1.0144949E=00,  | 1.0146513E=00,  | DATA 252 |

|     |                              |                 |                |                |                |          |   |
|-----|------------------------------|-----------------|----------------|----------------|----------------|----------|---|
| 265 | 273                          | 1.0148025E 00,  | 1.0149485E 00, | 1.0150895E 00, | 1.0152255E 00, | DATA 253 |   |
| 266 | 274                          | 1.0153568E 00,  | 1.0154837E 00, | 1.0156066E 00, | 1.0157256E 00, | DATA 254 |   |
| 267 | 275                          | 1.0158411E 00,  | 1.0159334E 00, | 1.0160625E 00, | 1.0161689E 00, | DATA 255 |   |
| 268 | 276                          | 1.0162723E 00,  | 1.0163726E 00, | 1.0164597E 00, | 1.0165635E 00, | DATA 256 |   |
| 269 | 277                          | 1.0166335E 00,  | 1.0167397E 00, | 1.0168217E 00, | 1.0168990E 00, | DATA 257 |   |
| 270 | 278                          | 1.0169717E 00,  | 1.0170393E 00, | 1.0171017E 00, | 1.0171886E 00, | DATA 258 |   |
| 271 | 279                          | 1.0172098E 00,  | 1.0172531E 00, | 1.0172945E 00, | 1.0173278E 00, | DATA 259 |   |
| 272 | DATA (RSUN (I), I=181, 216), |                 |                |                |                | DATA 260 | 6 |
| 273 | 281                          | 1.0173549E 00,  | 1.0173760E 00, | 1.0173911E 00, | 1.0174002E 00, | DATA 261 |   |
| 274 | 282                          | 1.0174037E 00,  | 1.0174019E 00, | 1.0173951E 00, | 1.0173835E 00, | DATA 262 |   |
| 275 | 283                          | 1.0173676E 00,  | 1.0173476E 00, | 1.0173239E 00, | 1.0172968E 00, | DATA 263 |   |
| 276 | 284                          | 1.0172663E 00,  | 1.0172324E 00, | 1.0171951E 00, | 1.0171544E 00, | DATA 264 |   |
| 277 | 285                          | 1.0171103E 00,  | 1.0170623E 00, | 1.0170105E 00, | 1.0169545E 00, | DATA 265 |   |
| 278 | 286                          | 1.0168941E 00,  | 1.0168291E 00, | 1.0167593E 00, | 1.0166845E 00, | DATA 266 |   |
| 279 | 287                          | 1.0166044E 00,  | 1.0165189E 00, | 1.0164278E 00, | 1.0163308E 00, | DATA 267 |   |
| 280 | 288                          | 1.0162281E 00,  | 1.0161195E 00, | 1.0160051E 00, | 1.0158847E 00, | DATA 268 |   |
| 281 | 289                          | 1.0157588E 00,  | 1.0156277E 00, | 1.0154916E 00, | 1.0153509E 00, | DATA 269 |   |
| 282 | DATA (RSUN (I), I=217, 252), |                 |                |                |                | DATA 270 | 6 |
| 283 | 291                          | 1.0152060E 00,  | 1.0150572E 00, | 1.0149048E 00, | 1.0147495E 00, | DATA 271 |   |
| 284 | 292                          | 1.0145911E 00,  | 1.0144299E 00, | 1.0142660E 00, | 1.0140997E 00, | DATA 272 |   |
| 285 | 293                          | 1.0139307E 00,  | 1.0137590E 00, | 1.0135846E 00, | 1.0134073E 00, | DATA 273 |   |
| 286 | 294                          | 1.0132269E 00,  | 1.0130434E 00, | 1.0128565E 00, | 1.0126660E 00, | DATA 274 |   |
| 287 | 295                          | 1.0124718E 00,  | 1.0122736E 00, | 1.0120713E 00, | 1.0118646E 00, | DATA 275 |   |
| 288 | 296                          | 1.0116534E 00,  | 1.0114377E 00, | 1.0112174E 00, | 1.0109922E 00, | DATA 276 |   |
| 289 | 297                          | 1.0107626E 00,  | 1.0105289E 00, | 1.0102912E 00, | 1.0100499E 00, | DATA 277 |   |
| 290 | 298                          | 1.0098054E 00,  | 1.0095581E 00, | 1.0093084E 00, | 1.0090563E 00, | DATA 278 |   |
| 291 | 299                          | 1.0088035E 00,  | 1.0085487E 00, | 1.0082927E 00, | 1.0080357E 00, | DATA 279 |   |
| 292 | DATA (RSUN (I), I=253, 288), |                 |                |                |                | DATA 280 | 6 |
| 293 | 301                          | 1.0077779E 00,  | 1.0075191E 00, | 1.0072594E 00, | 1.0069959E 00, | DATA 281 |   |
| 294 | 302                          | 1.0067374E 00,  | 1.0064749E 00, | 1.0062111E 00, | 1.0059462E 00, | DATA 282 |   |
| 295 | 303                          | 1.0056798E 00,  | 1.0054118E 00, | 1.0051420E 00, | 1.0048702E 00, | DATA 283 |   |
| 296 | 304                          | 1.0045962E 00,  | 1.0043198E 00, | 1.0040409E 00, | 1.0037593E 00, | DATA 284 |   |
| 297 | 305                          | 1.0034751E 00,  | 1.0031887E 00, | 1.0029001E 00, | 1.0026095E 00, | DATA 285 |   |
| 298 | 306                          | 1.0023175E 00,  | 1.0020244E 00, | 1.0017306E 00, | 1.0014367E 00, | DATA 286 |   |
| 299 | 307                          | 1.0011429E 00,  | 1.0008495E 00, | 1.0005569E 00, | 1.0002653E 00, | DATA 287 |   |
| 300 | 308                          | 9.9997491E-01,  | 9.9968587E-01, | 9.9939825E-01, | 9.9911218E-01, | DATA 288 |   |
| 301 | 309                          | 9.9882764E-01,  | 9.9854462E-01, | 9.9826308E-01, | 9.9798301E-01, | DATA 289 |   |
| 302 | DATA (RSUN (I), I=289, 324), |                 |                |                |                | DATA 290 | 6 |
| 303 | 311                          | 9.9770421E-01,  | 9.9742654E-01, | 9.9714985E-01, | 9.9687404E-01, | DATA 291 |   |
| 304 | 312                          | 9.9659882E-01,  | 9.9632394E-01, | 9.9604920E-01, | 9.9577428E-01, | DATA 292 |   |
| 305 | 313                          | 9.9549933E-01,  | 9.9522439E-01, | 9.9494953E-01, | 9.9467468E-01, | DATA 293 |   |
| 306 | 314                          | 9.9440034E-01,  | 9.9412692E-01, | 9.9385480E-01, | 9.9358445E-01, | DATA 294 |   |
| 307 | 315                          | 9.9331616E-01,  | 9.9305028E-01, | 9.9278713E-01, | 9.9252713E-01, | DATA 295 |   |
| 308 | 316                          | 9.9227043E-01,  | 9.9201725E-01, | 9.9176774E-01, | 9.9152210E-01, | DATA 296 |   |
| 309 | 317                          | 9.9128037E-01,  | 9.9104261E-01, | 9.9080886E-01, | 9.9057913E-01, | DATA 297 |   |
| 310 | 318                          | 9.9035329E-01,  | 9.9013123E-01, | 9.8991282E-01, | 9.8969800E-01, | DATA 298 |   |
| 311 | 319                          | 9.8948643E-01,  | 9.8927782E-01, | 9.8907197E-01, | 9.8886853E-01, | DATA 299 |   |
| 312 | DATA (RSUN (I), I=325, 360), |                 |                |                |                | DATA 300 | 6 |
| 313 | 321                          | 9.8866748E-01,  | 9.8846846E-01, | 9.8827204E-01, | 9.8807731E-01, | DATA 301 |   |
| 314 | 322                          | 9.8788495E-01,  | 9.8769521E-01, | 9.8750839E-01, | 9.8732484E-01, | DATA 302 |   |
| 315 | 323                          | 9.8714487E-01,  | 9.8696879E-01, | 9.8679696E-01, | 9.8662978E-01, | DATA 303 |   |
| 316 | 324                          | 9.8646744E-01,  | 9.8631015E-01, | 9.8615616E-01, | 9.8601165E-01, | DATA 304 |   |
| 317 | 325                          | 9.8587074E-01,  | 9.8573554E-01, | 9.8560611E-01, | 9.8548255E-01, | DATA 305 |   |
| 318 | 326                          | 9.8536475E-01,  | 9.8525263E-01, | 9.8514608E-01, | 9.8504504E-01, | DATA 306 |   |
| 319 | 327                          | 9.8494917E-01,  | 9.8485819E-01, | 9.8477183E-01, | 9.8468979E-01, | DATA 307 |   |
| 320 | 328                          | 9.8461182E-01,  | 9.8453770E-01, | 9.8446717E-01, | 9.8439988E-01, | DATA 308 |   |
| 321 | 329                          | 9.8433610E-01,  | 9.8427591E-01, | 9.8421946E-01, | 9.8416688E-01, | DATA 309 |   |
| 322 | DATA (RSUN (I), I=361, 368), |                 |                |                |                | DATA 310 | 6 |
| 323 | 331                          | 9.8411845E-01,  | 9.8407447E-01, | 9.8403522E-01, | 9.8400104E-01, | DATA 311 |   |
| 324 | 332                          | 9.8397212E-01,  | 9.8394869E-01, | 9.8393098E-01, | 9.8391918E-01, | DATA 312 |   |
| 325 | DATA (RAMOQN(I), I=1, 36),   |                 |                |                |                | DATA 312 | 6 |
| 326 | 341                          | 4.4976382E 00,  | 4.7512387E 00, | 4.9968311E 00, | 5.2314402E 00, | DATA 313 |   |
| 327 | 342                          | 5.4341825E 00,  | 5.6660106E 00, | 5.8691312E 00, | 6.0664484E 00, | DATA 314 |   |
| 328 | 343                          | 6.2611741E 00,  | 1.7340172E-01, | 3.7267324E-01, | 5.7867444E-01, | DATA 315 |   |
| 329 | 344                          | 7.9368982E-01,  | 1.0190137E 00, | 1.2545095E 00, | 1.4983881E 00, | DATA 316 |   |
| 330 | 345                          | 1.7472915E 00,  | 1.9974276E 00, | 2.2454167E 00, | 2.4893496E 00, | DATA 317 |   |
| 331 | 346                          | 2.7292604E 00,  | 2.9658575E 00, | 3.2019421E 00, | 3.4397317E 00, | DATA 318 |   |
| 332 | 347                          | 3.6811824E 00,  | 3.9271554E 00, | 4.1769437E 00, | 4.4281858E 00, | DATA 319 |   |
| 333 | 348                          | 4.6773587E 00,  | 4.9207568E 00, | 5.1555236E 00, | 5.3802837E 00, | DATA 320 |   |
| 334 | 349                          | 5.5951865E 00,  | 5.8016114E 00, | 6.0017336E 00, | 6.1981651E 00, | DATA 321 |   |
| 335 | DATA (RAMOQN(I), I=37, 72),  |                 |                |                |                | DATA 322 | 6 |
| 336 | 351                          | 1.1051635E-01,  | 3.0796254E-01, | 5.0997832E-01, | 7.1888613E-01, | DATA 323 |   |
| 337 | 352                          | 9.3641502E-01,  | 1.1633521E 00, | 1.3992678E 00, | 1.6424316E 00, | DATA 324 |   |
| 338 | 353                          | 1.89201419E 00, | 2.1394527E 00, | 2.3880269E 00, | 2.6347300E 00, | DATA 325 |   |



|     |                               |                |                |                |                 |          |
|-----|-------------------------------|----------------|----------------|----------------|-----------------|----------|
| 339 | 354                           | 2.8797432E 00, | 3.1242367E 00, | 3.3697803E 00, | 3.6176682E 00,  | DATA 326 |
| 340 | 355                           | 3.8682958E 00, | 4.1207569E 00, | 4.8728391E 00, | 4.6215142E 00,  | DATA 327 |
| 341 | 356                           | 4.8637673E 00, | 5.0973972E 00, | 5.3214568E 00, | 5.7431223E 00,  | DATA 328 |
| 342 | 357                           | 5.9439907E 00, | 6.1411631E 00, | 5.3876061E 02, | 2.5089332E 01,  | DATA 329 |
| 343 | 358                           | 4.5126591E 01, | 6.5693371E 01, | 8.6936776E 01, | 1.0893738E 00,  | DATA 330 |
| 344 | 359                           | 1.3169257E 00, | 1.5511248E 00, | 1.7905841E 00, | 2.8328534E 00,  | DATA 331 |
| 345 | DATA (RAMOQN(I), I=73, 1081)/ |                |                |                |                 | DATA 332 |
| 346 | 361                           | 2.2769680E 00, | 2.5219102E 00, | 2.7677997E 00, | 3.0153458E 00,  | DATA 333 |
| 347 | 362                           | 3.2663974E 00, | 3.5212923E 00, | 3.7801590E 00, | 4.0414252E 00,  | DATA 334 |
| 348 | 363                           | 4.3020390E 00, | 4.5581450E 00, | 4.8061653E 00, | 5.0437396E 00,  | DATA 335 |
| 349 | 364                           | 5.2701191E 00, | 5.4860119E 00, | 5.6931517E 00, | 5.8938473E 00,  | DATA 336 |
| 350 | 365                           | 6.0906390E 00, | 2.8849626E 03, | 1.9935141E 01, | 3.9897665E 01,  | DATA 337 |
| 351 | 366                           | 6.0348107E 01, | 8.1403319E 01, | 1.0311058E 00, | 1.2543978E 00,  | DATA 338 |
| 352 | 367                           | 1.4828997E 00, | 1.7151546E 00, | 1.9496831E 00, | 2.1854497E 00,  | DATA 339 |
| 353 | 368                           | 2.4222133E 00, | 2.6606523E 00, | 2.9022324E 00, | 3.1488257E 00,  | DATA 340 |
| 354 | 369                           | 3.4020940E 00, | 3.6526813E 00, | 3.9294107E 00, | 4.1989111E 00,  | DATA 341 |
| 355 | DATA (RAMOQN(I), I=109, 144)/ |                |                |                |                 | DATA 342 |
| 356 | 371                           | 4.4661466E 00, | 4.7258329E 00, | 4.9740116E 00, | 5.2089195E 00,  | DATA 343 |
| 357 | 372                           | 5.4309224E 00, | 5.6419003E 00, | 5.8445598E 00, | 6.0419191E 00,  | DATA 344 |
| 358 | 373                           | 6.2369873E 00, | 1.4938814E 01, | 3.4795834E 01, | 5.9148612E 01,  | DATA 345 |
| 359 | 374                           | 7.6127318E 01, | 9.776783E 01,  | 1.2004608E 00, | 1.4279667E 00,  | DATA 346 |
| 360 | 375                           | 1.6583610E 00, | 1.8897231E 00, | 2.1207116E 00, | 2.3509746E 00,  | DATA 347 |
| 361 | 376                           | 2.5812877E 00, | 2.8134310E 00, | 3.0498600E 00, | 3.2931904E 00,  | DATA 348 |
| 362 | 377                           | 3.5454661E 00, | 3.8072241E 00, | 4.0766084E 00, | 4.3491130E 00,  | DATA 349 |
| 363 | 378                           | 4.6185179E 00, | 4.8788111E 00, | 5.1259891E 00, | 5.3587617E 00,  | DATA 350 |
| 364 | 379                           | 5.5781602E 00, | 5.7868663E 00, | 5.9875388E 00, | 6.1840982E 00,  | DATA 351 |
| 365 | DATA (RAMOQN(I), I=145, 180)/ |                |                |                |                 | DATA 352 |
| 366 | 381                           | 9.648986E 02,  | 2.9393846E 01, | 4.9590139E 01, | 7.8420004E 01,  | DATA 353 |
| 367 | 382                           | 9.1979532E 01, | 1.1425308E 00, | 1.3710819E 00, | 1.6032127E 00,  | DATA 354 |
| 368 | 383                           | 1.8363612E 00, | 2.0683798E 00, | 2.2981462E 00, | 2.5258459E 00,  | DATA 355 |
| 369 | 384                           | 2.7529138E 00, | 2.9817389E 00, | 3.2152213E 00, | 3.4561872E 00,  | DATA 356 |
| 370 | 385                           | 3.7066140E 00, | 3.9666994E 00, | 4.2340868E 00, | 4.5038550E 00,  | DATA 357 |
| 371 | 386                           | 4.7697158E 00, | 5.0259930E 00, | 5.2692279E 00, | 5.4986276E 00,  | DATA 358 |
| 372 | 387                           | 5.7155458E 00, | 5.9226393E 00, | 6.1231585E 00, | 3.7305373E 02,  | DATA 359 |
| 373 | 388                           | 2.3470964E 01, | 4.3513254E 01, | 6.4101747E 01, | 8.5405832E 01,  | DATA 360 |
| 374 | 389                           | 1.0749181E 00, | 1.3030041E 00, | 1.5364935E 00, | 1.7727237E 00,  | DATA 361 |
| 375 | DATA (RAMOQN(I), I=181, 216)/ |                |                |                |                 | DATA 362 |
| 376 | 391                           | 2.0089272E 00, | 2.2430302E 00, | 2.4742005E 00, | 2.7029907E 00,  | DATA 363 |
| 377 | 392                           | 2.9311369E 00, | 3.1611539E 00, | 3.3958172E 00, | 3.6375325E 00,  | DATA 364 |
| 378 | 393                           | 3.8875856E 00, | 4.1453828E 00, | 4.4080398E 00, | 4.6707600E 00,  | DATA 365 |
| 379 | 394                           | 4.9282366E 00, | 5.1760617E 00, | 5.4119700E 00, | 5.6358543E 00,  | DATA 366 |
| 380 | 395                           | 5.8492687E 00, | 6.0547574E 00, | 6.2553136E 00, | 1.7084193E 01,  | DATA 367 |
| 381 | 396                           | 3.7067514E 01, | 5.7428207E 01, | 7.8380653E 01, | 1.80066308E 00, | DATA 368 |
| 382 | 397                           | 1.2251124E 00, | 1.4564236E 00, | 1.6926541E 00, | 1.9312678E 00,  | DATA 369 |
| 383 | 398                           | 2.1498179E 00, | 2.4066454E 00, | 2.6412900E 00, | 2.8745136E 00,  | DATA 370 |
| 384 | 399                           | 3.1000173E 00, | 3.3439743E 00, | 3.5844575E 00, | 3.8308049E 00,  | DATA 371 |
| 385 | DATA (RAMOQN(I), I=217, 252)/ |                |                |                |                 | DATA 372 |
| 386 | 401                           | 4.0830005E 00, | 4.3392926E 00, | 4.5963294E 00, | 4.8499568E 00,  | DATA 373 |
| 387 | 402                           | 5.0963652E 00, | 5.3331568E 00, | 5.5595151E 00, | 5.7762113E 00,  | DATA 374 |
| 388 | 403                           | 5.9850426E 00, | 6.1883896E 00, | 1.0367935E 01, | 3.0589129E 01,  | DATA 375 |
| 389 | 404                           | 5.0827090E 01, | 7.1491343E 01, | 9.2739737E 01, | 1.3465892E 00,  | DATA 376 |
| 390 | 405                           | 1.3724804E 00, | 1.6041606E 00, | 1.8400150E 00, | 2.0781607E 00,  | DATA 377 |
| 391 | 406                           | 2.3169987E 00, | 2.5556750E 00, | 2.7942862E 00, | 3.0337795E 00,  | DATA 378 |
| 392 | 407                           | 3.2756019E 00, | 3.5211805E 00, | 3.7713235E 00, | 4.0256763E 00,  | DATA 379 |
| 393 | 408                           | 4.2824392E 00, | 4.5389710E 00, | 4.7905109E 00, | 5.0351369E 00,  | DATA 380 |
| 394 | 409                           | 5.2705103E 00, | 5.4961331E 00, | 5.7127687E 00, | 5.9220554E 00,  | DATA 381 |
| 395 | DATA (RAMOQN(I), I=253, 288)/ |                |                |                |                 | DATA 382 |
| 396 | 411                           | 6.1261165E 00, | 4.4069197E 02, | 2.4455507E 01, | 4.4647425E 01,  | DATA 383 |
| 397 | 412                           | 6.5159865E 01, | 8.6126194E 01, | 1.0762427E 00, | 1.2966868E 00,  | DATA 384 |
| 398 | 413                           | 1.5221218E 00, | 1.7516080E 00, | 1.9840309E 00, | 2.2184673E 00,  | DATA 385 |
| 399 | 414                           | 2.4545133E 00, | 2.6924602E 00, | 2.9332577E 00, | 3.1782449E 00,  | DATA 386 |
| 400 | 415                           | 3.4286695E 00, | 3.6850542E 00, | 3.9465713E 00, | 4.2107252E 00,  | DATA 387 |
| 401 | 416                           | 4.4736570E 00, | 4.7311029E 00, | 4.9795740E 00, | 5.2171577E 00,  | DATA 388 |
| 402 | 417                           | 5.4436615E 00, | 5.6602625E 00, | 5.8689904E 00, | 6.0722688E 00,  | DATA 389 |
| 403 | 418                           | 6.2725906E 00, | 1.6911678E 01, | 3.9027792E 01, | 5.9451827E 01,  | DATA 390 |
| 404 | 419                           | 8.0294416E 01, | 1.0160427E 00, | 1.2336641E 00, | 1.4551159E 00,  | DATA 391 |
| 405 | DATA (RAMOQN(I), I=289, 324)/ |                |                |                |                 | DATA 392 |
| 406 | 421                           | 1.6793917E 00, | 1.9055038E 00, | 2.1328339E 00, | 2.3614058E 00,  | DATA 393 |
| 407 | 422                           | 2.5920083E 00, | 2.8261422E 00, | 3.0657850E 00, | 3.3129455E 00,  | DATA 394 |
| 408 | 423                           | 3.5689894E 00, | 3.8337922E 00, | 4.1050137E 00, | 4.3780752E 00,  | DATA 395 |
| 409 | 424                           | 4.6471311E 00, | 4.9068651E 00, | 5.1539361E 00, | 5.3874527E 00,  | DATA 396 |
| 410 | 425                           | 5.6085417E 00, | 5.8195753E 00, | 6.0234823E 00, | 6.2232849E 00,  | DATA 397 |
| 411 | 426                           | 1.3863535E 01, | 3.3837938E 01, | 5.4129910E 01, | 7.4871038E 01,  | DATA 398 |
| 412 | 427                           | 9.6115013E 01, | 1.1783219E 00, | 1.3991898E 00, | 1.6222652E 00,  | DATA 399 |

|     |     |                            |                 |                 |                 |          |
|-----|-----|----------------------------|-----------------|-----------------|-----------------|----------|
| 413 | 428 | 1.8460451E 00,             | 2.0694812E 00,  | 2.2923345E 00,  | 2.5153353E 00,  | DATA 400 |
| 414 | 429 | 2.7401474E 00,             | 2.9691732E 00,  | 3.2052068E 00,  | 3.4508858E 00,  | DATA 401 |
| 415 |     | DATA (RMOON(I),I=329,360)/ |                 |                 |                 | DATA 402 |
| 416 | 431 | 3.7078709E 00,             | 3.9758116E 00,  | 4.2515137E 00,  | 4.5290681E 00,  | DATA 403 |
| 417 | 432 | 4.8013997E 00,             | 5.0625300E 00,  | 5.3409223E 00,  | 5.6111507E 00,  | DATA 404 |
| 418 | 433 | 5.7401268E 00,             | 5.9691276E 00,  | 6.1715399E 00,  | 6.4524710E 02,  | DATA 405 |
| 419 | 434 | 2.8650274E-01,             | 4.8786760E-01,  | 6.9355904E-01,  | 9.8469661E-01,  | DATA 406 |
| 420 | 435 | 1.1214263E 00,             | 1.3428898E 00,  | 1.5674179E 00,  | 1.7929743E 00,  | DATA 407 |
| 421 | 436 | 2.0177440E 00,             | 2.2406670E 00,  | 2.4617524E 00,  | 2.6821308E 00,  | DATA 408 |
| 422 | 437 | 2.9039035E 00,             | 3.1298595E 00,  | 3.3630717E 00,  | 3.6063074E 00,  | DATA 409 |
| 423 | 438 | 3.8611822E 00,             | 4.1271425E 00,  | 4.4007336E 00,  | 4.6759031E 00,  | DATA 410 |
| 424 | 439 | 4.9456716E 00,             | 5.2043709E 00,  | 5.4490815E 00,  | 5.6797009E 00,  | DATA 411 |
| 425 |     | DATA (RMOON(I),I=361,392)/ |                 |                 |                 | DATA 412 |
| 426 | 441 | 5.8981376E 00,             | 6.1073686E 00,  | 2.8554449E-02,  | 2.2835802E-01,  | DATA 413 |
| 427 | 442 | 4.2958504E-01,             | 6.3374125E-01,  | 8.4266123E-01,  | 1.8573101E 00,  | DATA 414 |
| 428 |     | DATA (RMOON(I),I=393,424)/ |                 |                 |                 | DATA 415 |
| 429 | 451 | -3.5204177E-01,            | -3.4981264E-01, | -3.2096634E-01, | -2.7574319E-01, | DATA 416 |
| 430 | 452 | -2.1808736E-01,            | -1.5194868E-01, | -8.0866206E-02, | -7.8415895E-03, | DATA 417 |
| 431 | 453 | -6.4585507E-02,            | 1.3415607E-01,  | 1.9867473E-01,  | 2.5580821E-01,  | DATA 418 |
| 432 | 454 | 3.0295043E-01,             | 3.3721929E-01,  | 3.5565964E-01,  | 3.5569070E-01,  | DATA 419 |
| 433 | 455 | 3.3572626E-01,             | 2.9575190E-01,  | 2.8759587E-01,  | 1.6476751E-01,  | DATA 420 |
| 434 | 456 | 8.1964098E-02,             | -5.3244849E-03, | -9.2316581E-02, | -1.7326909E-01, | DATA 421 |
| 435 | 457 | -2.4367787E-01,            | -2.9945253E-01, | -3.3736300E-01, | -3.5537043E-01, | DATA 422 |
| 436 | 458 | -3.5293023E-01,            | -3.3108360E-01, | -2.9223216E-01, | -2.3966508E-01, | DATA 423 |
| 437 | 459 | -1.7702647E-01,            | -1.0789175E-01, | -3.9524304E-02, | 3.7198971E-02,  | DATA 424 |
| 438 |     | DATA (RMOON(I),I=425,456)/ |                 |                 |                 | DATA 425 |
| 439 | 461 | 1.0773995E-01,             | 1.7377953E-01,  | 2.3306862E-01,  | 2.8328986E-01,  | DATA 426 |
| 440 | 462 | 3.2197654E-01,             | 3.4654425E-01,  | 3.5449106E-01,  | 3.4378598E-01,  | DATA 427 |
| 441 | 463 | 3.1338485E-01,             | 2.6371989E-01,  | 1.9697884E-01,  | 1.2705673E-01,  | DATA 428 |
| 442 | 464 | 2.9202159E-02,             | -6.0578090E-02, | -1.4614293E-01, | -2.2161451E-01, | DATA 429 |
| 443 | 465 | -2.8285926E-01,            | -3.2581789E-01, | -3.4875382E-01, | -3.9131675E-01, | DATA 430 |
| 444 | 466 | -3.3461605E-01,            | -3.0089648E-01, | -2.5311276E-01, | -1.2842491E-01, | DATA 431 |
| 445 | 467 | -5.7930323E-02,            | 1.4044920E-02,  | 8.4809954E-02,  | 1.5165374E-01,  | DATA 432 |
| 446 | 468 | 2.1278601E-01,             | 2.6527676E-01,  | 3.0701772E-01,  | 3.3573490E-01,  | DATA 433 |
| 447 | 469 | 3.4928308E-01,             | 3.4584004E-01,  | 3.2419069E-01,  | 2.8405574E-01,  | DATA 434 |
| 448 |     | DATA (RMOON(I),I=457,488)/ |                 |                 |                 | DATA 435 |
| 449 | 471 | 2.2639821E-01,             | 1.5364064E-01,  | 6.9734697E-02,  | -1.9978588E-02, | DATA 436 |
| 450 | 472 | -1.0917108E-01,            | -1.9119447E-01, | -2.5991939E-01, | -3.1056851E-01, | DATA 437 |
| 451 | 473 | -3.1032229E-01,            | -3.4852351E-01, | -3.8641916E-01, | -3.8657408E-01, | DATA 438 |
| 452 | 474 | -2.6220855E-01,            | -2.0668045E-01, | -1.4319651E-01, | -7.4719013E-02, | DATA 439 |
| 453 | 475 | -3.9887602E-03,            | 6.6403879E-02,  | 1.3395865E-01,  | 1.9619737E-01,  | DATA 440 |
| 454 | 476 | 2.5067031E-01,             | 2.9497663E-01,  | 3.2384213E-01,  | 3.4424893E-01,  | DATA 441 |
| 455 | 477 | 3.4559993E-01,             | 3.2989593E-01,  | 2.9689332E-01,  | 2.4722946E-01,  | DATA 442 |
| 456 | 478 | 1.8252949E-01,             | 1.0551860E-01,  | 2.0130876E-02,  | -6.8462836E-02, | DATA 443 |
| 457 | 479 | -1.5405023E-01,            | -2.2993773E-01, | -2.8989670E-01, | -3.2928625E-01, | DATA 444 |
| 458 |     | DATA (RMOON(I),I=489,520)/ |                 |                 |                 | DATA 445 |
| 459 | 481 | -3.4392340E-01,            | -3.4027692E-01, | -3.1490499E-01, | -2.7348794E-01, | DATA 446 |
| 460 | 482 | -2.1994179E-01,            | -1.5788678E-01, | -9.0472493E-02, | -2.0429779E-02, | DATA 447 |
| 461 | 483 | 4.9780235E-02,             | 1.1780615E-01,  | 1.8128266E-01,  | 2.3776992E-01,  | DATA 448 |
| 462 | 484 | 2.8477428E-01,             | 3.1986056E-01,  | 3.4084759E-01,  | 3.4605087E-01,  | DATA 449 |
| 463 | 485 | 3.3450632E-01,             | 3.0610732E-01,  | 2.6162656E-01,  | 2.0265960E-01,  | DATA 450 |
| 464 | 486 | 1.3156886E-01,             | 5.1496975E-02,  | -3.8544606E-02, | -1.3859063E-01, | DATA 451 |
| 465 | 487 | -1.9780325E-01,            | -2.6491584E-01, | -3.1414328E-01, | -3.4138386E-01, | DATA 452 |
| 466 | 488 | -3.4318926E-01,            | -3.2692951E-01, | -2.9005193E-01, | -2.3892176E-01, | DATA 453 |
| 467 | 489 | -1.7785324E-01,            | -1.1060465E-01, | -4.0282830E-02, | 3.0521659E-02,  | DATA 454 |
| 468 |     | DATA (RMOON(I),I=521,552)/ |                 |                 |                 | DATA 455 |
| 469 | 491 | 9.9517403E-02,             | 1.6450003E-01,  | 2.2320013E-01,  | 2.7320675E-01,  | DATA 456 |
| 470 | 492 | 3.1202367E-01,             | 3.3724743E-01,  | 3.4686621E-01,  | 3.3959763E-01,  | DATA 457 |
| 471 | 493 | 3.1514881E-01,             | 2.7430001E-01,  | 2.1880300E-01,  | 1.5118238E-01,  | DATA 458 |
| 472 | 494 | 7.4561046E-02,             | -7.4103815E-03, | -9.0520516E-02, | -1.6994493E-01, | DATA 459 |
| 473 | 495 | -2.4032850E-01,            | -2.9618563E-01, | -3.3271574E-01, | -3.4686447E-01, | DATA 460 |
| 474 | 496 | -3.3813104E-01,            | -3.0860301E-01, | -2.6217386E-01, | -2.0343171E-01, | DATA 461 |
| 475 | 497 | -1.3676956E-01,            | -6.5945105E-02, | 5.9787611E-03,  | 7.6479341E-02,  | DATA 462 |
| 476 | 498 | 1.4334350E-01,             | 2.0444467E-01,  | 2.5757814E-01,  | 3.0039474E-01,  | DATA 463 |
| 477 | 499 | 3.3047020E-01,             | 3.4553361E-01,  | 3.4382882E-01,  | 3.2450833E-01,  | DATA 464 |
| 478 |     | DATA (RMOON(I),I=553,584)/ |                 |                 |                 | DATA 465 |
| 479 | 501 | 2.8791026E-01,             | 2.3560588E-01,  | 1.7022249E-01,  | 9.5154823E-02,  | DATA 466 |
| 480 | 502 | 1.4295785E-02,             | -6.8120574E-02, | -1.4759043E-01, | -2.1938676E-01, | DATA 467 |
| 481 | 503 | -2.7872588E-01,            | -3.2118061E-01, | -3.4336431E-01, | -3.4268549E-01, | DATA 468 |
| 482 | 504 | -3.2278097E-01,            | -2.8332749E-01, | -2.2931269E-01, | -1.6515347E-01, | DATA 469 |
| 483 | 505 | -9.5023995E-02,            | -2.2524855E-02, | 4.9360657E-02,  | 1.2814012E-01,  | DATA 470 |
| 484 | 506 | 1.8161708E-01,             | 2.3769783E-01,  | 2.8424810E-01,  | 3.1904392E-01,  | DATA 471 |
| 485 | 507 | 3.3985907E-01,             | 3.4468359E-01,  | 3.3212802E-01,  | 3.0177477E-01,  | DATA 472 |
| 486 | 508 | 2.5447574E-01,             | 1.9240597E-01,  | 1.2888943E-01,  | 3.8112095E-02,  | DATA 473 |



|     |     |                             |                 |                 |                 |          |   |
|-----|-----|-----------------------------|-----------------|-----------------|-----------------|----------|---|
| 487 | 509 | -4.5268162E=02,             | -1.2636554E=01, | -2.0032396E=01, | -2.6253565E=01/ | DATA 473 |   |
| 488 |     | DATA (BCMOQN(I)),I=217,252/ |                 |                 |                 | DATA 474 | 6 |
| 489 | 511 | -3.0893635E=01,             | -3.3641815E=01, | -3.4329552E=01, | -3.2963094E=01, | DATA 475 |   |
| 490 | 512 | -2.9721813E=01,             | -2.4918571E=01, | -1.8939122E=01, | -1.2184167E=01, | DATA 476 |   |
| 491 | 513 | -5.0293401E=02,             | 2.1938836E=02,  | 9.2005738E=02,  | 1.5744324E=01,  | DATA 477 |   |
| 492 | 514 | 2.1404570E=01,              | 2.6573784E=01,  | 3.0448588E=01,  | 3.3028416E=01,  | DATA 478 |   |
| 493 | 515 | 3.4124755E=01,              | 3.3582065E=01,  | 3.4307739E=01,  | 2.7304255E=01,  | DATA 479 |   |
| 494 | 516 | 2.1694445E=01,              | 1.4732306E=01,  | 6.9959293E=02,  | -1.6367135E=02, | DATA 480 |   |
| 495 | 517 | -1.0025486E=01,             | -1.7814080E=01, | -2.4479156E=01, | -2.9578882E=01, | DATA 481 |   |
| 496 | 518 | -3.2797210E=01,             | -3.3976921E=01, | -3.8131040E=01, | -3.8425745E=01, | DATA 482 |   |
| 497 | 519 | -2.6139604E=01,             | -2.0614073E=01, | -1.4210513E=01, | -7.2810347E=02/ | DATA 483 |   |
| 498 |     | DATA (BCMOQN(I)),I=253,288/ |                 |                 |                 | DATA 484 | 6 |
| 499 | 521 | -1.5301124E=03,             | 6.8763989E=02,  | 1.8539571E=01,  | 1.9594518E=01,  | DATA 485 |   |
| 500 | 522 | 2.4820000E=01,              | 2.9011611E=01,  | 3.1980846E=01,  | 3.8558988E=01,  | DATA 486 |   |
| 501 | 523 | 3.3606740E=01,              | 3.2029201E=01,  | 2.8794519E=01,  | 2.8953849E=01,  | DATA 487 |   |
| 502 | 524 | 1.7660401E=01,              | 1.0184849E=01,  | 1.9224137E=02,  | -6.6159476E=02, | DATA 488 |   |
| 503 | 525 | -1.4836436E=01,             | -2.2122541E=01, | -2.7916018E=01, | -3.1800406E=01, | DATA 489 |   |
| 504 | 526 | -3.3561595E=01,             | -3.3203035E=01, | -3.0911029E=01, | -2.6989017E=01, | DATA 490 |   |
| 505 | 527 | -2.1790470E=01,             | -1.5671220E=01, | -8.9657928E=02, | -1.9814183E=02, | DATA 491 |   |
| 506 | 528 | 4.9989343E=02,              | 1.1711128E=01,  | 1.7905745E=01,  | 2.8346929E=01,  | DATA 492 |   |
| 507 | 529 | 2.7814746E=01,              | 3.1110939E=01,  | 3.3067380E=01,  | 3.8555861E=01/  | DATA 493 |   |
| 508 |     | DATA (BCMOQN(I)),I=289,324/ |                 |                 |                 | DATA 494 | 6 |
| 509 | 531 | 3.2497394E=01,              | 2.9869535E=01,  | 2.5711974E=01,  | 2.0132779E=01,  | DATA 495 |   |
| 510 | 532 | 1.3318657E=01,              | 5.5506286E=02,  | -2.7787193E=02, | -1.1157809E=01, | DATA 496 |   |
| 511 | 533 | -1.8975984E=01,             | -2.5586670E=01, | -3.0413592E=01, | -3.3070230E=01, | DATA 497 |   |
| 512 | 534 | -3.3438823E=01,             | -3.1666411E=01, | -2.8084765E=01, | -2.3104577E=01, | DATA 498 |   |
| 513 | 535 | -1.7133250E=01,             | -1.0534315E=01, | -3.6203487E=02, | 3.3364578E=02,  | DATA 499 |   |
| 514 | 536 | 1.0088657E=01,              | 1.6400203E=01,  | 2.2039108E=01,  | 2.6777709E=01,  | DATA 500 |   |
| 515 | 537 | 3.0400859E=01,              | 3.2720672E=01,  | 3.3594293E=01,  | 3.2939414E=01,  | DATA 501 |   |
| 516 | 538 | 3.0742593E=01,              | 2.7058656E=01,  | 2.2004229E=01,  | 1.5751979E=01,  | DATA 502 |   |
| 517 | 539 | 8.5320429E=02,              | 6.4379895E=03,  | -7.5251195E=02, | -1.5483749E=01/ | DATA 503 |   |
| 518 |     | DATA (BCMOQN(I)),I=325,360/ |                 |                 |                 | DATA 504 | 6 |
| 519 | 541 | -2.2646593E=01,             | -2.8389494E=01, | -3.2161365E=01, | -3.3621324E=01, | DATA 505 |   |
| 520 | 542 | -3.2730348E=01,             | -2.9737677E=01, | -2.5073808E=01, | -1.9221290E=01, | DATA 506 |   |
| 521 | 543 | -1.2424814E=01,             | -5.6556083E=02, | 1.988032E=02,   | 8.2494835E=02,  | DATA 507 |   |
| 522 | 544 | 1.4712928E=01,              | 2.0562548E=01,  | 2.9583574E=01,  | 2.9560550E=01,  | DATA 508 |   |
| 523 | 545 | 3.2289137E=01,              | 3.3597425E=01,  | 3.8371116E=01,  | 3.4573907E=01,  | DATA 509 |   |
| 524 | 546 | 2.8255310E=01,              | 2.3544210E=01,  | 1.7633614E=01,  | 1.0765845E=01,  | DATA 510 |   |
| 525 | 547 | 3.2261626E=02,              | -4.6521802E=02, | -1.2474621E=01, | -1.9773968E=01, | DATA 511 |   |
| 526 | 548 | -2.6018808E=01,             | -3.0662931E=01, | -3.8244927E=01, | -3.3511016E=01, | DATA 512 |   |
| 527 | 549 | -3.1495454E=01,             | -2.7502482E=01, | -2.2001056E=01, | -1.5499385E=01/ | DATA 513 |   |
| 528 |     | DATA (BCMOQN(I)),I=361,368/ |                 |                 |                 | DATA 514 | 6 |
| 529 | 551 | -8.4875102E=02,             | -1.2528067E=02, | -5.8163216E=02, | -1.2508884E=01, | DATA 515 |   |
| 530 | 552 | 1.8616284E=01,              | 2.3941814E=01,  | 2.8288932E=01,  | 3.1461320E=01/  | DATA 516 |   |
| 531 |     | DATA (RMOQN(I)),I=1,36/     |                 |                 |                 | DATA 516 | 6 |
| 532 | 561 | 5.9099398E 01,              | 5.9615105E 01,  | 6.0216896E 01,  | 6.8872860E 01,  | DATA 517 |   |
| 533 | 562 | 6.1340197E 01,              | 6.2169731E 01,  | 6.2711267E 01,  | 6.8118868E 01,  | DATA 518 |   |
| 534 | 563 | 6.3355391E 01,              | 6.3396008E 01,  | 6.3230635E 01,  | 6.2865290E 01,  | DATA 519 |   |
| 535 | 564 | 6.2322363E 01,              | 6.1639649E 01,  | 6.0846794E 01,  | 6.8067029E 01,  | DATA 520 |   |
| 536 | 565 | 5.9299847E 01,              | 5.8625445E 01,  | 5.8091560E 01,  | 5.7728540E 01,  | DATA 521 |   |
| 537 | 566 | 5.7546307E 01,              | 5.7535336E 01,  | 5.7671435E 01,  | 5.7922857E 01,  | DATA 522 |   |
| 538 | 567 | 5.8257626E 01,              | 5.8649204E 01,  | 5.9079391E 01,  | 5.9538285E 01,  | DATA 523 |   |
| 539 | 568 | 6.0021799E 01,              | 6.0527708E 01,  | 6.1051414E 01,  | 6.1582510E 01,  | DATA 524 |   |
| 540 | 569 | 6.2102891E 01,              | 6.2586685E 01,  | 6.3001944E 01,  | 6.3313897E 01/  | DATA 525 |   |
| 541 |     | DATA (RMOQN(I)),I=37,72/    |                 |                 |                 | DATA 526 | 6 |
| 542 | 571 | 6.3487788E 01,              | 6.3494959E 01,  | 6.3314712E 01,  | 6.2938708E 01,  | DATA 527 |   |
| 543 | 572 | 6.2373525E 01,              | 6.1642518E 01,  | 6.0786410E 01,  | 5.9862084E 01,  | DATA 528 |   |
| 544 | 573 | 5.8939026E 01,              | 5.8093012E 01,  | 5.7397111E 01,  | 5.6911129E 01,  | DATA 529 |   |
| 545 | 574 | 5.6671930E 01,              | 5.6687778E 01,  | 5.6938361E 01,  | 5.7381161E 01,  | DATA 530 |   |
| 546 | 575 | 5.7961290E 01,              | 5.8622023E 01,  | 5.9313213E 01,  | 5.9986254E 01,  | DATA 531 |   |
| 547 | 576 | 6.0645442E 01,              | 6.1246445E 01,  | 6.1792935E 01,  | 6.2712738E 01,  | DATA 532 |   |
| 548 | 577 | 6.3078056E 01,              | 6.3367861E 01,  | 6.3566229E 01,  | 6.3653142E 01,  | DATA 533 |   |
| 549 | 578 | 6.3606938E 01,              | 6.3407603E 01,  | 6.3040529E 01,  | 6.2500392E 01,  | DATA 534 |   |
| 550 | 579 | 6.1794801E 01,              | 6.0947343E 01,  | 5.9999443E 01,  | 5.9010187E 01/  | DATA 535 |   |
| 551 |     | DATA (RMOQN(I)),I=73,108/   |                 |                 |                 | DATA 536 | 6 |
| 552 | 581 | 5.8053329E 01,              | 5.7210728E 01,  | 5.6562014E 01,  | 5.6171759E 01,  | DATA 537 |   |
| 553 | 582 | 5.6077340E 01,              | 5.6281630E 01,  | 5.6753275E 01,  | 5.7434422E 01,  | DATA 538 |   |
| 554 | 583 | 5.8252946E 01,              | 5.9133142E 01,  | 6.0015723E 01,  | 6.0843724E 01,  | DATA 539 |   |
| 555 | 584 | 6.1384424E 01,              | 6.2218227E 01,  | 6.2737653E 01,  | 6.3143464E 01,  | DATA 540 |   |
| 556 | 585 | 6.3440937E 01,              | 6.3634049E 01,  | 6.3726352E 01,  | 6.3716409E 01,  | DATA 541 |   |
| 557 | 586 | 6.3597638E 01,              | 6.3361033E 01,  | 6.2996524E 01,  | 6.2496506E 01,  | DATA 542 |   |
| 558 | 587 | 6.1859732E 01,              | 6.1095322E 01,  | 6.0226413E 01,  | 5.9292744E 01,  | DATA 543 |   |
| 559 | 588 | 5.8351110E 01,              | 5.7472653E 01,  | 5.6736166E 01,  | 5.6217335E 01,  | DATA 544 |   |
| 560 | 589 | 5.5975377E 01,              | 5.6040833E 01,  | 5.6408478E 01,  | 5.7038358E 01/  | DATA 545 |   |

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361 DATA (RMOON (I), I=109, 144)/ DATA 546 6
362 591 5.7864204E 01, 5.8806589E 01, 5.9795015E 01, 6.0728693E 01, DATA 547
363 592 6.1582108E 01, 6.2307301E 01, 6.2883209E 01, 6.3303223E 01, DATA 548
364 593 6.3571741E 01, 6.3700226E 01, 6.3703248E 01, 6.3595081E 01, DATA 549
365 594 6.3387230E 01, 6.3087102E 01, 6.2697085E 01, 6.2219923E 01, DATA 550
366 595 6.1652138E 01, 6.0999751E 01, 6.0270780E 01, 5.9486941E 01, DATA 551
367 596 5.8482936E 01, 5.7907761E 01, 5.7222107E 01, 5.6691949E 01, DATA 552
368 597 5.6378604E 01, 5.6327018E 01, 5.6555511E 01, 5.7050519E 01, DATA 553
369 598 5.7768240E 01, 5.8642511E 01, 5.9596033E 01, 6.0551582E 01, DATA 554
370 599 6.1440838E 01, 6.2209950E 01, 6.2822026E 01, 6.3257208E 01, DATA 555
371 DATA (RMOON (I), I=145, 180)/ DATA 556 6
372 601 6.3511068E 01, 6.3591953E 01, 6.3517631E 01, 6.3311609E 01, DATA 557
373 602 6.2999913E 01, 6.2605860E 01, 6.2151559E 01, 6.1652301E 01, DATA 558
374 603 6.1110694E 01, 6.0557652E 01, 5.9975211E 01, 5.9380131E 01, DATA 559
375 604 5.8787600E 01, 5.8222023E 01, 5.7717836E 01, 5.7317462E 01, DATA 560
376 605 5.7066126E 01, 5.7004045E 01, 5.7157651E 01, 5.7532314E 01, DATA 561
377 606 5.8108933E 01, 5.8845493E 01, 5.9683004E 01, 6.0553882E 01, DATA 562
378 607 6.1390561E 01, 6.2132683E 01, 6.2732135E 01, 6.3155879E 01, DATA 563
379 608 6.3386925E 01, 6.423877E 01, 6.5279372E 01, 6.2977644E 01, DATA 564
380 609 6.2551361E 01, 6.2037920E 01, 6.1475458E 01, 6.0898993E 01, DATA 565
381 DATA (RMOON (I), I=181, 216)/ DATA 566 6
382 611 6.0337248E 01, 5.9810800E 01, 5.9331986E 01, 5.8906674E 01, DATA 567
383 612 5.8537497E 01, 5.8227714E 01, 5.7984610E 01, 5.7821343E 01, DATA 568
384 613 5.7756448E 01, 5.7810779E 01, 5.8002490E 01, 5.8341030E 01, DATA 569
385 614 5.8822649E 01, 5.9427481E 01, 6.0120290E 01, 6.0853843E 01, DATA 570
386 615 6.1574213E 01, 6.2226764E 01, 6.2761720E 01, 6.3138674E 01, DATA 571
387 616 6.3329803E 01, 6.3321811E 01, 6.3116735E 01, 6.2731668E 01, DATA 572
388 617 6.2197430E 01, 6.1556099E 01, 6.0837373E 01, 6.0153789E 01, DATA 573
389 618 5.9495190E 01, 5.8923256E 01, 5.8467142E 01, 5.8141343E 01, DATA 574
390 619 5.7946384E 01, 5.7872180E 01, 5.7903105E 01, 5.8023291E 01, DATA 575
391 DATA (RMOON (I), I=217, 252)/ DATA 576 6
392 621 5.8220648E 01, 5.8488632E 01, 5.8825501E 01, 5.9231505E 01, DATA 577
393 622 5.9704994E 01, 6.0238589E 01, 6.0816473E 01, 6.1413475E 01, DATA 578
394 623 6.1996105E 01, 6.2525274E 01, 6.2960064E 01, 6.3261920E 01, DATA 579
395 624 6.3398665E 01, 6.3348032E 01, 6.3100492E 01, 6.2661284E 01, DATA 580
396 625 6.2051493E 01, 6.1307957E 01, 6.0481667E 01, 5.9634251E 01, DATA 581
397 626 5.8832323E 01, 5.8139964E 01, 5.7610396E 01, 5.7278349E 01, DATA 582
398 627 5.7156061E 01, 5.7232946E 01, 5.7480406E 01, 5.7859428E 01, DATA 583
399 628 5.8328868E 01, 5.8852182E 01, 5.9401336E 01, 5.9957663E 01, DATA 584
400 629 6.0510173E 01, 6.1052281E 01, 6.1578023E 01, 6.2078718E 01, DATA 585
401 DATA (RMOON (I), I=253, 288)/ DATA 586 6
402 631 6.2540707E 01, 6.2944529E 01, 6.3265637E 01, 6.3476566E 01, DATA 587
403 632 6.3549716E 01, 6.3461058E 01, 6.3193703E 01, 6.2741467E 01, DATA 588
404 633 6.2111980E 01, 6.1329023E 01, 6.0433661E 01, 5.9483528E 01, DATA 589
405 634 5.8549503E 01, 5.7709268E 01, 5.7037786E 01, 5.6599986E 01, DATA 590
406 635 5.6420307E 01, 5.6516419E 01, 5.6889468E 01, 5.7400856E 01, DATA 591
407 636 5.8079064E 01, 5.8830992E 01, 5.9600872E 01, 6.0342475E 01, DATA 592
408 637 6.1035637E 01, 6.1654830E 01, 6.2195895E 01, 6.2657080E 01, DATA 593
409 638 6.3038173E 01, 6.3337251E 01, 6.3548501E 01, 6.3661454E 01, DATA 594
410 639 6.3661626E 01, 6.3532382E 01, 6.3257781E 01, 6.2826215E 01, DATA 595
411 DATA (RMOON (I), I=289, 324)/ DATA 596 6
412 641 6.2234412E 01, 6.1491286E 01, 6.0621207E 01, 5.9666119E 01, DATA 597
413 642 5.8485623E 01, 5.7753970E 01, 5.6953142E 01, 5.6361963E 01, DATA 598
414 643 5.6042791E 01, 5.6029189E 01, 5.6318791E 01, 5.6874207E 01, DATA 599
415 644 5.7631631E 01, 5.8513937E 01, 5.9443816E 01, 6.0353730E 01, DATA 600
416 645 6.1191585E 01, 6.1922517E 01, 6.2527704E 01, 6.3001321E 01, DATA 601
417 646 6.3346631E 01, 6.3571893E 01, 6.3686516E 01, 6.3697942E 01, DATA 602
418 647 6.3809667E 01, 6.3420551E 01, 6.3125459E 01, 6.2717285E 01, DATA 603
419 648 6.2190206E 01, 6.1543656E 01, 6.0786492E 01, 5.9940803E 01, DATA 604
420 649 5.9044704E 01, 5.8153012E 01, 5.7334631E 01, 5.665777E 01, DATA 605
421 DATA (RMOON (I), I=325, 360)/ DATA 606 6
422 651 5.6219077E 01, 5.6050263E 01, 5.6186034E 01, 5.6617412E 01, DATA 607
423 652 5.7300808E 01, 5.8167031E 01, 5.9134171E 01, 6.0120541E 01, DATA 608
424 653 6.1054523E 01, 6.1880415E 01, 6.2560705E 01, 6.3075605E 01, DATA 609
425 654 6.3420732E 01, 6.3603733E 01, 6.3640417E 01, 6.3550786E 01, DATA 610
426 655 6.3355349E 01, 6.3072065E 01, 6.2714274E 01, 6.2289911E 01, DATA 611
427 656 6.1802265E 01, 6.1252258E 01, 6.0641839E 01, 5.9978054E 01, DATA 612
428 657 5.9277126E 01, 5.8567651E 01, 5.7891735E 01, 5.7303039E 01, DATA 613
429 658 5.6861081E 01, 5.6622031E 01, 5.6627610E 01, 5.6899102E 01, DATA 614
430 659 5.7411800E 01, 5.8135897E 01, 5.9003399E 01, 5.9938620E 01, DATA 615
431 DATA (RMOON (I), I=361, 366)/ DATA 616 6
432 661 6.0863017E 01, 6.1714042E 01, 6.2431035E 01, 6.2978276E 01, DATA 617
433 662 6.3335635E 01, 6.3489538E 01, 6.3480696E 01, 6.3301058E 01, DATA 618
434 END DATA 619 6

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71034 02 11-03-72 11,742 1976 EPHENERIS

## PREFACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

## PRIMARY SYMDEF ENTRY

YABLE 0

## SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1 EPHBLK 11

SYMREF

END OF BINARY CARD \*1976\*19  
4273 IS THE NEXT AVAILABLE LOCATION.  
GMAP VERSION/ASSEMBLY DATES JMAP 110171/102971 JMAPB 110171/102971 JMPC 110171/102971  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19411 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY,

71034 02 11-03-72 11,761 1977 EPHENERIS

|    |         |                                                                       |      |    |
|----|---------|-----------------------------------------------------------------------|------|----|
| 1  | C*1977* | 1977 EPHENERIS                                                        | DATA | 1  |
| 2  |         | SUBROUTINE TABLE                                                      | DATA | 2  |
| 3  |         | DIMENSION RASUN (369), DCSUN (369), RSUN (369)                        | DATA | 3  |
| 4  |         | DIMENSION RAMOON (369), DCMOON (369), RMOON (369)                     | DATA | 4  |
| 5  |         | DIMENSION ARRAY (2214)                                                |      |    |
| 6  |         | DOUBLE PRECISION V                                                    |      |    |
| 7  |         | EQUIVALENCE (RASUN, ARRAY), (DCSUN, ARRAY (370)), (RSUN, ARRAY (739)) |      |    |
| 8  |         | EQUIVALENCE (RAMOON, ARRAY (1108)), (DCMOON, ARRAY (1477))            |      |    |
| 9  |         | EQUIVALENCE (RMOON, ARRAY (1846))                                     |      |    |
| 10 |         | COMMON /EPHBLK/ V(4), I                                               |      |    |
| 11 |         | Y(1) = ARRAY(1)                                                       |      |    |
| 12 |         | Y(2) = ARRAY(1+1)                                                     |      |    |
| 13 |         | Y(3) = ARRAY(1+2)                                                     |      |    |
| 14 |         | Y(4) = ARRAY(1+3)                                                     |      |    |
| 15 |         | RETURN                                                                |      |    |
| 16 |         | DATA (RASUN (1), I = 1, 36) /                                         | DATA | 6  |
| 17 | 11      | 4.8917311E 00, 4.9110085E 00, 4.9302626E 00, 4.9494911E 00, DATA 7    |      |    |
| 18 | 12      | 4.9686922E 00, 4.9878638E 00, 4.9070040E 00, 5.0261110E 00, DATA 8    |      |    |
| 19 | 13      | 5.0451831E 00, 5.0642187E 00, 5.0832162E 00, 5.1021742E 00, DATA 9    |      |    |
| 20 | 14      | 5.1210911E 00, 5.1399656E 00, 5.1587963E 00, 5.1775820E 00, DATA 10   |      |    |
| 21 | 15      | 5.1963208E 00, 5.2150111E 00, 5.2336515E 00, 5.2522402E 00, DATA 11   |      |    |
| 22 | 16      | 5.2707759E 00, 5.2892570E 00, 5.3076822E 00, 5.3260508E 00, DATA 12   |      |    |
| 23 | 17      | 5.3443616E 00, 5.3626141E 00, 5.3808076E 00, 5.3989415E 00, DATA 13   |      |    |
| 24 | 18      | 5.4170156E 00, 5.4350294E 00, 5.4529830E 00, 5.4708760E 00, DATA 14   |      |    |
| 25 | 19      | 5.4887087E 00, 5.5064810E 00, 5.5241930E 00, 5.5418453E 00, DATA 15   |      |    |
| 26 |         | DATA (RASUN (1), I = 37, 72) /                                        | DATA | 16 |
| 27 | 21      | 5.5594382E 00, 5.5769723E 00, 5.5944484E 00, 5.6118671E 00, DATA 17   |      |    |
| 28 | 22      | 5.6292292E 00, 5.6465356E 00, 5.6637872E 00, 5.6809845E 00, DATA 18   |      |    |
| 29 | 23      | 5.6981281E 00, 5.7152184E 00, 5.7322563E 00, 5.7492421E 00, DATA 19   |      |    |
| 30 | 24      | 5.7661762E 00, 5.7830592E 00, 5.7998920E 00, 5.8166752E 00, DATA 20   |      |    |
| 31 | 25      | 5.8334098E 00, 5.8500966E 00, 5.8667366E 00, 5.8833308E 00, DATA 21   |      |    |
| 32 | 26      | 5.8998803E 00, 5.9163864E 00, 5.9328500E 00, 5.9492725E 00, DATA 22   |      |    |
| 33 | 27      | 5.9656552E 00, 5.9819993E 00, 5.9983063E 00, 6.0145776E 00, DATA 23   |      |    |
| 34 | 28      | 6.0308149E 00, 6.0470200E 00, 6.0631943E 00, 6.0793402E 00, DATA 24   |      |    |
| 35 | 29      | 6.0954590E 00, 6.1115528E 00, 6.1276233E 00, 6.1436719E 00, DATA 25   |      |    |
| 36 |         | DATA (RASUN (1), I = 73, 108) /                                       | DATA | 26 |
| 37 | 31      | 6.1597001E 00, 6.1757092E 00, 6.1917006E 00, 6.2076756E 00, DATA 27   |      |    |
| 38 | 32      | 6.2236354E 00, 6.2395812E 00, 6.2555144E 00, 6.2714362E 00, DATA 28   |      |    |
| 39 | 33      | 4.1427033E-03, 2.0065742E-02, 3.5961236E-02, 5.1850546E-02, DATA 29   |      |    |
| 40 | 34      | 6.7734976E-02, 8.3615831E-02, 9.9494429E-02, 1.1537210E-01, DATA 30   |      |    |
| 41 | 35      | 1.3125021E-01, 1.4713013E-01, 1.6301316E-01, 1.7890098E-01, DATA 31   |      |    |
| 42 | 36      | 1.9479514E-01, 2.1069741E-01, 2.2660930E-01, 2.4253276E-01, DATA 32   |      |    |
| 43 | 37      | 2.5846958E-01, 2.7442142E-01, 2.9039013E-01, 3.0637690E-01, DATA 33   |      |    |

|     |     |                                |                |                |                |          |   |
|-----|-----|--------------------------------|----------------|----------------|----------------|----------|---|
| 44  | 38  | 3.2238305E-01,                 | 3.3840983E-01, | 3.9445861E-01, | 3.7053034E-01, | DATA 34  |   |
| 45  | 39  | 3.6662611E-01,                 | 4.0274696E-01, | 4.1889397E-01, | 4.3506780E-01, | DATA 35  |   |
| 46  |     | DATA (RASUN (I)), I=109, 144)/ |                |                |                | DATA 36  | 6 |
| 47  | 41  | 4.5126967E-01,                 | 4.6750029E-01, | 4.8376041E-01, | 5.0069077E-01, | DATA 37  |   |
| 48  | 42  | 5.1637216E-01,                 | 5.3272523E-01, | 5.4911062E-01, | 5.6552901E-01, | DATA 38  |   |
| 49  | 43  | 5.8198100E-01,                 | 5.9846723E-01, | 6.1498823E-01, | 6.3154484E-01, | DATA 39  |   |
| 50  | 44  | 6.4813787E-01,                 | 6.6476874E-01, | 6.8143626E-01, | 6.9814339E-01, | DATA 40  |   |
| 51  | 45  | 7.1489041E-01,                 | 7.3167814E-01, | 7.4850731E-01, | 7.6537827E-01, | DATA 41  |   |
| 52  | 46  | 7.8229150E-01,                 | 7.9924725E-01, | 8.1624600E-01, | 8.3328769E-01, | DATA 42  |   |
| 53  | 47  | 8.5037234E-01,                 | 8.6749994E-01, | 8.8467037E-01, | 9.0188337E-01, | DATA 43  |   |
| 54  | 48  | 9.1913862E-01,                 | 9.3643564E-01, | 9.5377385E-01, | 9.7119268E-01, | DATA 44  |   |
| 55  | 49  | 9.8657143E-01,                 | 1.0060293E 00, | 1.0235236E 00, | 1.0410893E 00, | DATA 45  |   |
| 56  |     | DATA (RASUN (I)), I=145, 180)/ |                |                |                | DATA 46  | 6 |
| 57  | 51  | 1.0586276E 00,                 | 1.0762356E 00, | 1.0938763E 00, | 1.1115509E 00, | DATA 47  |   |
| 58  | 52  | 1.1292386E 00,                 | 1.1469986E 00, | 1.1647699E 00, | 1.1825720E 00, | DATA 48  |   |
| 59  | 53  | 1.2004042E 00,                 | 1.2182657E 00, | 1.2361556E 00, | 1.2540728E 00, | DATA 49  |   |
| 60  | 54  | 1.2720162E 00,                 | 1.2899848E 00, | 1.3079777E 00, | 1.3259933E 00, | DATA 50  |   |
| 61  | 55  | 1.3440302E 00,                 | 1.3620870E 00, | 1.3801624E 00, | 1.3982543E 00, | DATA 51  |   |
| 62  | 56  | 1.4163618E 00,                 | 1.4344822E 00, | 1.4526141E 00, | 1.4707554E 00, | DATA 52  |   |
| 63  | 57  | 1.4889042E 00,                 | 1.5070584E 00, | 1.5252161E 00, | 1.5433753E 00, | DATA 53  |   |
| 64  | 58  | 1.5615339E 00,                 | 1.5796899E 00, | 1.5978413E 00, | 1.6159865E 00, | DATA 54  |   |
| 65  | 59  | 1.6341236E 00,                 | 1.6522511E 00, | 1.6703671E 00, | 1.6884704E 00, | DATA 55  |   |
| 66  |     | DATA (RASUN (I)), I=181, 216)/ |                |                |                | DATA 56  | 6 |
| 67  | 61  | 1.7065596E 00,                 | 1.7246334E 00, | 1.7426901E 00, | 1.7607285E 00, | DATA 57  |   |
| 68  | 62  | 1.7787475E 00,                 | 1.7967456E 00, | 1.8147221E 00, | 1.8326755E 00, | DATA 58  |   |
| 69  | 63  | 1.8306045E 00,                 | 1.8685080E 00, | 1.8863848E 00, | 1.9042337E 00, | DATA 59  |   |
| 70  | 64  | 1.9220531E 00,                 | 1.9398419E 00, | 1.9575987E 00, | 1.9753222E 00, | DATA 60  |   |
| 71  | 65  | 1.9930110E 00,                 | 2.0106640E 00, | 2.0282799E 00, | 2.0458573E 00, | DATA 61  |   |
| 72  | 66  | 2.0633954E 00,                 | 2.0808930E 00, | 2.0983342E 00, | 2.1157633E 00, | DATA 62  |   |
| 73  | 67  | 2.1331345E 00,                 | 2.1504623E 00, | 2.1677461E 00, | 2.1849857E 00, | DATA 63  |   |
| 74  | 68  | 2.2021810E 00,                 | 2.2193316E 00, | 2.2364375E 00, | 2.2534987E 00, | DATA 64  |   |
| 75  | 69  | 2.2705153E 00,                 | 2.2874878E 00, | 2.3044166E 00, | 2.3213019E 00, | DATA 65  |   |
| 76  |     | DATA (RASUN (I)), I=217, 252)/ |                |                |                | DATA 66  | 6 |
| 77  | 71  | 2.3381441E 00,                 | 2.3549436E 00, | 2.3717010E 00, | 2.3884163E 00, | DATA 67  |   |
| 78  | 72  | 2.4050900E 00,                 | 2.4217224E 00, | 2.4383137E 00, | 2.4548643E 00, | DATA 68  |   |
| 79  | 73  | 2.4713743E 00,                 | 2.4878443E 00, | 2.5042744E 00, | 2.5206651E 00, | DATA 69  |   |
| 80  | 74  | 2.5370167E 00,                 | 2.5533297E 00, | 2.5696046E 00, | 2.5858420E 00, | DATA 70  |   |
| 81  | 75  | 2.6020426E 00,                 | 2.6182072E 00, | 2.6343364E 00, | 2.6504313E 00, | DATA 71  |   |
| 82  | 76  | 2.6664923E 00,                 | 2.6825219E 00, | 2.6985196E 00, | 2.7144872E 00, | DATA 72  |   |
| 83  | 77  | 2.7304260E 00,                 | 2.7463376E 00, | 2.7622235E 00, | 2.7780851E 00, | DATA 73  |   |
| 84  | 78  | 2.7939240E 00,                 | 2.8097416E 00, | 2.8255396E 00, | 2.8413192E 00, | DATA 74  |   |
| 85  | 79  | 2.8570816E 00,                 | 2.8728285E 00, | 2.8885608E 00, | 2.9042800E 00, | DATA 75  |   |
| 86  |     | DATA (RASUN (I)), I=253, 288)/ |                |                |                | DATA 76  | 6 |
| 87  | 81  | 2.9199873E 00,                 | 2.9356837E 00, | 2.9513707E 00, | 2.9670493E 00, | DATA 77  |   |
| 88  | 82  | 2.9827206E 00,                 | 2.9983859E 00, | 3.0140463E 00, | 3.0297032E 00, | DATA 78  |   |
| 89  | 83  | 3.0453577E 00,                 | 3.0610110E 00, | 3.0766643E 00, | 3.0923190E 00, | DATA 79  |   |
| 90  | 84  | 3.1079763E 00,                 | 3.1236378E 00, | 3.1393048E 00, | 3.1549789E 00, | DATA 80  |   |
| 91  | 85  | 3.1706619E 00,                 | 3.1863557E 00, | 3.2020620E 00, | 3.2177828E 00, | DATA 81  |   |
| 92  | 86  | 3.2335197E 00,                 | 3.2492746E 00, | 3.2650492E 00, | 3.2808453E 00, | DATA 82  |   |
| 93  | 87  | 3.2966643E 00,                 | 3.3125079E 00, | 3.3283775E 00, | 3.3442748E 00, | DATA 83  |   |
| 94  | 88  | 3.3602009E 00,                 | 3.3761573E 00, | 3.3921434E 00, | 3.4081665E 00, | DATA 84  |   |
| 95  | 89  | 3.4242217E 00,                 | 3.4403123E 00, | 3.4564396E 00, | 3.4726045E 00, | DATA 85  |   |
| 96  |     | DATA (RASUN (I)), I=289, 324)/ |                |                |                | DATA 86  | 6 |
| 97  | 91  | 3.4888082E 00,                 | 3.5050515E 00, | 3.5213353E 00, | 3.5376607E 00, | DATA 87  |   |
| 98  | 92  | 3.5540286E 00,                 | 3.5704402E 00, | 3.5868954E 00, | 3.6033987E 00, | DATA 88  |   |
| 99  | 93  | 3.6199482E 00,                 | 3.6365464E 00, | 3.6531946E 00, | 3.6698942E 00, | DATA 89  |   |
| 100 | 94  | 3.6866465E 00,                 | 3.7034526E 00, | 3.7203138E 00, | 3.7372311E 00, | DATA 90  |   |
| 101 | 95  | 3.7542055E 00,                 | 3.7712379E 00, | 3.7883292E 00, | 3.8054800E 00, | DATA 91  |   |
| 102 | 96  | 3.8226911E 00,                 | 3.8399629E 00, | 3.8572963E 00, | 3.8746913E 00, | DATA 92  |   |
| 103 | 97  | 3.8921485E 00,                 | 3.9096679E 00, | 3.9272499E 00, | 3.9448943E 00, | DATA 93  |   |
| 104 | 98  | 3.9626008E 00,                 | 3.9803689E 00, | 3.9981982E 00, | 4.0160881E 00, | DATA 94  |   |
| 105 | 99  | 4.0340381E 00,                 | 4.0520476E 00, | 4.0701160E 00, | 4.0882432E 00, | DATA 95  |   |
| 106 |     | DATA (RASUN (I)), I=325, 360)/ |                |                |                | DATA 96  | 6 |
| 107 | 101 | 4.1064287E 00,                 | 4.1246721E 00, | 4.1429731E 00, | 4.1613312E 00, | DATA 97  |   |
| 108 | 102 | 4.1797498E 00,                 | 4.1982163E 00, | 4.2167418E 00, | 4.2353215E 00, | DATA 98  |   |
| 109 | 103 | 4.2539545E 00,                 | 4.2726398E 00, | 4.2913761E 00, | 4.3101622E 00, | DATA 99  |   |
| 110 | 104 | 4.3289969E 00,                 | 4.3478786E 00, | 4.3668060E 00, | 4.3857772E 00, | DATA 100 |   |
| 111 | 105 | 4.4047908E 00,                 | 4.4238446E 00, | 4.4429373E 00, | 4.4620662E 00, | DATA 101 |   |
| 112 | 106 | 4.4812289E 00,                 | 4.5004228E 00, | 4.5196453E 00, | 4.5388938E 00, | DATA 102 |   |
| 113 | 107 | 4.5581654E 00,                 | 4.5774575E 00, | 4.5967672E 00, | 4.6160924E 00, | DATA 103 |   |
| 114 | 108 | 4.6354307E 00,                 | 4.6547799E 00, | 4.6741375E 00, | 4.6935015E 00, | DATA 104 |   |
| 115 | 109 | 4.7128693E 00,                 | 4.7322389E 00, | 4.7516078E 00, | 4.7709737E 00, | DATA 105 |   |
| 116 |     | DATA (RASUN (I)), I=361, 368)/ |                |                |                | DATA 106 | 6 |



|     |     |                               |                 |                 |                 |          |
|-----|-----|-------------------------------|-----------------|-----------------|-----------------|----------|
| 117 | 111 | 4.7903345E 00,                | 4.8096677E 00,  | 4.8290312E 00,  | 4.8483628E 00,  | DATA 107 |
| 118 | 112 | 4.8676803E 00,                | 4.8869814E 00,  | 4.9062641E 00,  | 4.9255262E 00,  | DATA 108 |
| 119 |     | DATA (BCSUN (I),I= 1, 36)/    |                 |                 |                 | DATA 108 |
| 120 | 121 | -4.0323514E-01,               | -4.0190655E-01, | -4.0044433E-01, | -3.9884920E-01, | DATA 109 |
| 121 | 122 | -3.9712198E-01,               | -3.9526349E-01, | -3.9327455E-01, | -3.9113615E-01, | DATA 110 |
| 122 | 123 | -3.8890925E-01,               | -3.8653490E-01, | -3.8403411E-01, | -3.8140811E-01, | DATA 111 |
| 123 | 124 | -3.7865806E-01,               | -3.7578528E-01, | -3.7279109E-01, | -3.6967704E-01, | DATA 112 |
| 124 | 125 | -3.6644480E-01,               | -3.6309536E-01, | -3.5963076E-01, | -3.5605309E-01, | DATA 113 |
| 125 | 126 | -3.5236342E-01,               | -3.4856368E-01, | -3.4465563E-01, | -3.4064101E-01, | DATA 114 |
| 126 | 127 | -3.3652155E-01,               | -3.3229908E-01, | -3.2797546E-01, | -3.235253E-01,  | DATA 115 |
| 127 | 128 | -3.1903215E-01,               | -3.1441621E-01, | -3.0970666E-01, | -3.0490537E-01, | DATA 116 |
| 128 | 129 | -3.0001421E-01,               | -2.9503520E-01, | -2.8997017E-01, | -2.8482112E-01, | DATA 117 |
| 129 |     | DATA (BCSUN (I),I= 37, 72)/   |                 |                 |                 | DATA 118 |
| 130 | 131 | -2.7958983E-01,               | -2.7427824E-01, | -2.6888824E-01, | -2.6342574E-01, | DATA 119 |
| 131 | 132 | -2.5788066E-01,               | -2.5226694E-01, | -2.4658237E-01, | -2.4082963E-01, | DATA 120 |
| 132 | 133 | -2.3501018E-01,               | -2.2912637E-01, | -2.2318023E-01, | -2.1717392E-01, | DATA 121 |
| 133 | 134 | -2.1110955E-01,               | -2.0488922E-01, | -1.9881502E-01, | -1.9258895E-01, | DATA 122 |
| 134 | 135 | -1.8631307E-01,               | -1.7998943E-01, | -1.7362007E-01, | -1.6720498E-01, | DATA 123 |
| 135 | 136 | -1.6075216E-01,               | -1.5425758E-01, | -1.4772521E-01, | -1.4115700E-01, | DATA 124 |
| 136 | 137 | -1.3455486E-01,               | -1.2792072E-01, | -1.2125650E-01, | -1.1456398E-01, | DATA 125 |
| 137 | 138 | -1.0784497E-01,               | -1.0110125E-01, | -9.6334570E-02, | -8.7546673E-02, | DATA 126 |
| 138 | 139 | -8.0739297E-02,               | -7.3914197E-02, | -6.7073090E-02, | -6.0217883E-02, | DATA 127 |
| 139 |     | DATA (BCSUN (I),I= 73, 108)/  |                 |                 |                 | DATA 128 |
| 140 | 141 | -5.3350442E-02,               | -4.6472642E-02, | -3.9586323E-02, | -3.2693410E-02, | DATA 129 |
| 141 | 142 | -2.5795778E-02,               | -1.8895288E-02, | -1.1993797E-02, | -5.8931252E-03, | DATA 130 |
| 142 | 143 | 1.8049071E-03,                | 8.6984821E-03,  | 1.9585766E-02,  | 2.2464985E-02,  | DATA 131 |
| 143 | 144 | 2.9334362E-02,                | 3.6192120E-02,  | 4.3036503E-02,  | 4.9863763E-02,  | DATA 132 |
| 144 | 145 | 5.6678171E-02,                | 6.3472006E-02,  | 7.0245532E-02,  | 7.6997137E-02,  | DATA 133 |
| 145 | 146 | 8.3725197E-02,                | 9.0428124E-02,  | 9.7104298E-02,  | 1.0375224E-01,  | DATA 134 |
| 146 | 147 | 1.1037040E-01,                | 1.1695723E-01,  | 1.2351123E-01,  | 1.3003069E-01,  | DATA 135 |
| 147 | 148 | 1.3651395E-01,                | 1.4295935E-01,  | 1.4936523E-01,  | 1.5572986E-01,  | DATA 136 |
| 148 | 149 | 1.6205153E-01,                | 1.6832858E-01,  | 1.7455931E-01,  | 1.8074209E-01,  | DATA 137 |
| 149 |     | DATA (BCSUN (I),I= 109, 144)/ |                 |                 |                 | DATA 138 |
| 150 | 151 | 1.8487523E-01,                | 1.9295705E-01,  | 1.9898588E-01,  | 2.0496006E-01,  | DATA 139 |
| 151 | 152 | 2.1087795E-01,                | 2.1673793E-01,  | 2.2253832E-01,  | 2.2827752E-01,  | DATA 140 |
| 152 | 153 | 2.3395388E-01,                | 2.3956580E-01,  | 2.4511166E-01,  | 2.5058990E-01,  | DATA 141 |
| 153 | 154 | 2.5299902E-01,                | 2.6135750E-01,  | 2.6660380E-01,  | 2.7179460E-01,  | DATA 142 |
| 154 | 155 | 2.7691444E-01,                | 2.8195598E-01,  | 2.8691972E-01,  | 2.9180427E-01,  | DATA 143 |
| 155 | 156 | 2.9660811E-01,                | 3.0132977E-01,  | 3.0596785E-01,  | 3.1052082E-01,  | DATA 144 |
| 156 | 157 | 3.1498722E-01,                | 3.1936563E-01,  | 3.2365465E-01,  | 3.2785289E-01,  | DATA 145 |
| 157 | 158 | 3.3195899E-01,                | 3.3597162E-01,  | 3.3988937E-01,  | 3.4371100E-01,  | DATA 146 |
| 158 | 159 | 3.4743516E-01,                | 3.5106059E-01,  | 3.5458605E-01,  | 3.5801030E-01,  | DATA 147 |
| 159 |     | DATA (BCSUN (I),I= 145, 180)/ |                 |                 |                 | DATA 148 |
| 160 | 161 | 3.6133211E-01,                | 3.6455037E-01,  | 3.6766387E-01,  | 3.7067154E-01,  | DATA 149 |
| 161 | 162 | 3.7357227E-01,                | 3.7636510E-01,  | 3.7904901E-01,  | 3.8162318E-01,  | DATA 150 |
| 162 | 163 | 3.8408673E-01,                | 3.8643884E-01,  | 3.8867870E-01,  | 3.9080553E-01,  | DATA 151 |
| 163 | 164 | 3.9281856E-01,                | 3.9471700E-01,  | 3.9650023E-01,  | 3.9816748E-01,  | DATA 152 |
| 164 | 165 | 3.9971815E-01,                | 4.0113169E-01,  | 4.0246762E-01,  | 4.0368546E-01,  | DATA 153 |
| 165 | 166 | 4.0474481E-01,                | 4.0570527E-01,  | 4.0654658E-01,  | 4.0726841E-01,  | DATA 154 |
| 166 | 167 | 4.0787053E-01,                | 4.0835276E-01,  | 4.0871496E-01,  | 4.0895705E-01,  | DATA 155 |
| 167 | 168 | 4.0907896E-01,                | 4.0908064E-01,  | 4.0896215E-01,  | 4.0872354E-01,  | DATA 156 |
| 168 | 169 | 4.0836496E-01,                | 4.0788655E-01,  | 4.0728863E-01,  | 4.0657147E-01,  | DATA 157 |
| 169 |     | DATA (BCSUN (I),I= 181, 216)/ |                 |                 |                 | DATA 158 |
| 170 | 171 | 4.0373536E-01,                | 4.0478077E-01,  | 4.0370803E-01,  | 4.0251760E-01,  | DATA 159 |
| 171 | 172 | 4.0120998E-01,                | 3.9978562E-01,  | 3.9824504E-01,  | 3.9658885E-01,  | DATA 160 |
| 172 | 173 | 3.9481767E-01,                | 3.9293222E-01,  | 3.9093329E-01,  | 3.8882164E-01,  | DATA 161 |
| 173 | 174 | 3.8659820E-01,                | 3.8426384E-01,  | 3.8181951E-01,  | 3.7926621E-01,  | DATA 162 |
| 174 | 175 | 3.7660492E-01,                | 3.7383672E-01,  | 3.7096263E-01,  | 3.6798382E-01,  | DATA 163 |
| 175 | 176 | 3.6490136E-01,                | 3.6171643E-01,  | 3.5843022E-01,  | 3.5504388E-01,  | DATA 164 |
| 176 | 177 | 3.5155859E-01,                | 3.4797560E-01,  | 3.4429623E-01,  | 3.4052168E-01,  | DATA 165 |
| 177 | 178 | 3.3665327E-01,                | 3.3269231E-01,  | 3.2864007E-01,  | 3.2449783E-01,  | DATA 166 |
| 178 | 179 | 3.2026688E-01,                | 3.1594848E-01,  | 3.1154386E-01,  | 3.0705439E-01,  | DATA 167 |
| 179 |     | DATA (BCSUN (I),I= 217, 252)/ |                 |                 |                 | DATA 168 |
| 180 | 181 | 3.0246143E-01,                | 2.9782637E-01,  | 2.9309059E-01,  | 2.8827556E-01,  | DATA 169 |
| 181 | 182 | 2.8338280E-01,                | 2.7841378E-01,  | 2.7337002E-01,  | 2.6825308E-01,  | DATA 170 |
| 182 | 183 | 2.6306451E-01,                | 2.5780584E-01,  | 2.5247862E-01,  | 2.4708446E-01,  | DATA 171 |
| 183 | 184 | 2.4162496E-01,                | 2.3610167E-01,  | 2.3051619E-01,  | 2.2487003E-01,  | DATA 172 |
| 184 | 185 | 2.1916479E-01,                | 2.1340203E-01,  | 2.0758340E-01,  | 2.0171037E-01,  | DATA 173 |
| 185 | 186 | 1.9578455E-01,                | 1.8980746E-01,  | 1.8378063E-01,  | 1.7770554E-01,  | DATA 174 |
| 186 | 187 | 1.7158366E-01,                | 1.6541639E-01,  | 1.5920514E-01,  | 1.5295141E-01,  | DATA 175 |
| 187 | 188 | 1.4665665E-01,                | 1.4032235E-01,  | 1.3394998E-01,  | 1.2754512E-01,  | DATA 176 |
| 188 | 189 | 1.2109733E-01,                | 1.1462019E-01,  | 1.0811129E-01,  | 1.0157226E-01,  | DATA 177 |
| 189 |     | DATA (BCSUN (I),I= 253, 288)/ |                 |                 |                 | DATA 178 |

|     |     |                             |                 |                 |                 |          |
|-----|-----|-----------------------------|-----------------|-----------------|-----------------|----------|
| 190 | 191 | 9.5004722E-02,              | 8.8410510E-02,  | 8.1790640E-02,  | 7.5147416E-02,  | DATA 179 |
| 191 | 192 | 6.8482300E-02,              | 6.1796956E-02,  | 5.9093034E-02,  | 4.8372205E-02,  | DATA 180 |
| 192 | 193 | 4.1636141E-02,              | 3.4886527E-02,  | 2.9125105E-02,  | 2.3353491E-02,  | DATA 181 |
| 193 | 194 | 1.4273330E-02,              | 7.7663449E-03,  | 9.9416237E-04,  | 5.8016893E-03,  | DATA 182 |
| 194 | 195 | -1.2500488E-02,             | -1.9397829E-02, | -2.4195118E-02, | -3.2909779E-02, | DATA 183 |
| 195 | 196 | -3.9780230E-02,             | -4.6564880E-02, | -5.8342131E-02, | -6.8110298E-02, | DATA 184 |
| 196 | 197 | -6.6867704E-02,             | -7.3612633E-02, | -8.0343381E-02, | -8.7058173E-02, | DATA 185 |
| 197 | 198 | -9.3755241E-02,             | -1.0043279E-01, | -1.0708904E-01, | -1.1372211E-01, | DATA 186 |
| 198 | 199 | -1.2033015E-01,             | -1.2691132E-01, | -1.3346379E-01, | -1.3998965E-01, | DATA 187 |
| 199 |     | DATA (BCSUN (1),I=289,324)/ |                 |                 |                 | DATA 188 |
| 200 | 201 | -1.4647499E-01,             | -1.5292990E-01, | -1.5934841E-01, | -1.6572861E-01, | DATA 189 |
| 201 | 202 | -1.7206859E-01,             | -1.7536641E-01, | -1.8462006E-01, | -1.9082776E-01, | DATA 190 |
| 202 | 203 | -1.9698762E-01,             | -2.0309781E-01, | -2.0913646E-01, | -2.1516181E-01, | DATA 191 |
| 203 | 204 | -2.2111194E-01,             | -2.2700501E-01, | -2.3283918E-01, | -2.3861250E-01, | DATA 192 |
| 204 | 205 | -2.4432309E-01,             | -2.4996902E-01, | -2.5554833E-01, | -2.6109907E-01, | DATA 193 |
| 205 | 206 | -2.6649927E-01,             | -2.7186692E-01, | -2.7716011E-01, | -2.8237477E-01, | DATA 194 |
| 206 | 207 | -2.8751495E-01,             | -2.9257264E-01, | -2.9754797E-01, | -3.0243884E-01, | DATA 195 |
| 207 | 208 | -3.0724336E-01,             | -3.1195951E-01, | -3.1658528E-01, | -3.2111876E-01, | DATA 196 |
| 208 | 209 | -3.2555795E-01,             | -3.2990692E-01, | -3.3414568E-01, | -3.3829046E-01, | DATA 197 |
| 209 |     | DATA (BCSUN (1),I=325,360)/ |                 |                 |                 | DATA 198 |
| 210 | 211 | -3.4233342E-01,             | -3.4627283E-01, | -3.5010597E-01, | -3.5383414E-01, | DATA 199 |
| 211 | 212 | -3.5745269E-01,             | -3.6096100E-01, | -3.6435747E-01, | -3.6764052E-01, | DATA 200 |
| 212 | 213 | -3.7080860E-01,             | -3.7386017E-01, | -3.7679381E-01, | -3.7960800E-01, | DATA 201 |
| 213 | 214 | -3.8230137E-01,             | -3.8487251E-01, | -3.8732014E-01, | -3.8964294E-01, | DATA 202 |
| 214 | 215 | -3.9183971E-01,             | -3.9390932E-01, | -3.9585067E-01, | -3.9766278E-01, | DATA 203 |
| 215 | 216 | -3.9934465E-01,             | -4.0089539E-01, | -4.0231421E-01, | -4.0360020E-01, | DATA 204 |
| 216 | 217 | -4.0475264E-01,             | -4.0577084E-01, | -4.0665410E-01, | -4.0740192E-01, | DATA 205 |
| 217 | 218 | -4.0801384E-01,             | -4.0848948E-01, | -4.0882836E-01, | -4.0903089E-01, | DATA 206 |
| 218 | 219 | -4.0909629E-01,             | -4.092474E-01,  | -4.0881619E-01, | -4.0847076E-01, | DATA 207 |
| 219 |     | DATA (BCSUN (1),I=361,368)/ |                 |                 |                 | DATA 208 |
| 220 | 221 | -4.0798853E-01,             | -4.0736969E-01, | -4.0661453E-01, | -4.0572339E-01, | DATA 209 |
| 221 | 222 | -4.0469661E-01,             | -4.0353467E-01, | -4.0223810E-01, | -4.0080747E-01, | DATA 210 |
| 222 |     | DATA (RSUN (1),I=1,36)/     |                 |                 |                 | DATA 210 |
| 223 | 231 | 9.8394869E-01,              | 9.8393098E-01,  | 9.8391919E-01,  | 9.8391347E-01,  | DATA 211 |
| 224 | 232 | 9.8391397E-01,              | 9.8392080E-01,  | 9.8393405E-01,  | 9.8395376E-01,  | DATA 212 |
| 225 | 233 | 9.8397978E-01,              | 9.8401205E-01,  | 9.8405038E-01,  | 9.8409499E-01,  | DATA 213 |
| 226 | 234 | 9.8414499E-01,              | 9.8420027E-01,  | 9.8426038E-01,  | 9.8432553E-01,  | DATA 214 |
| 227 | 235 | 9.8439477E-01,              | 9.8446801E-01,  | 9.8454473E-01,  | 9.8462510E-01,  | DATA 215 |
| 228 | 236 | 9.8470896E-01,              | 9.8479632E-01,  | 9.8488705E-01,  | 9.8498141E-01,  | DATA 216 |
| 229 | 237 | 9.8507955E-01,              | 9.8518167E-01,  | 9.8528802E-01,  | 9.8539874E-01,  | DATA 217 |
| 230 | 238 | 9.8551404E-01,              | 9.8563413E-01,  | 9.8575917E-01,  | 9.8588937E-01,  | DATA 218 |
| 231 | 239 | 9.8602488E-01,              | 9.8616584E-01,  | 9.8631242E-01,  | 9.8646460E-01,  | DATA 219 |
| 232 |     | DATA (RSUN (1),I=37,72)/    |                 |                 |                 | DATA 220 |
| 233 | 241 | 9.8662241E-01,              | 9.8678578E-01,  | 9.8695483E-01,  | 9.8712714E-01,  | DATA 221 |
| 234 | 242 | 9.8730845E-01,              | 9.8749245E-01,  | 9.8768086E-01,  | 9.8787326E-01,  | DATA 222 |
| 235 | 243 | 9.8800622E-01,              | 9.8826840E-01,  | 9.8847028E-01,  | 9.8867474E-01,  | DATA 223 |
| 236 | 244 | 9.8888158E-01,              | 9.8909065E-01,  | 9.8930165E-01,  | 9.8951473E-01,  | DATA 224 |
| 237 | 245 | 9.8972992E-01,              | 9.8994728E-01,  | 9.9016695E-01,  | 9.9038901E-01,  | DATA 225 |
| 238 | 246 | 9.9061362E-01,              | 9.9084095E-01,  | 9.9107112E-01,  | 9.9130434E-01,  | DATA 226 |
| 239 | 247 | 9.9154077E-01,              | 9.9178060E-01,  | 9.9202394E-01,  | 9.9227092E-01,  | DATA 227 |
| 240 | 248 | 9.9252161E-01,              | 9.9277607E-01,  | 9.9303430E-01,  | 9.9329650E-01,  | DATA 228 |
| 241 | 249 | 9.9356188E-01,              | 9.9383035E-01,  | 9.9410171E-01,  | 9.9437548E-01,  | DATA 229 |
| 242 |     | DATA (RSUN (1),I=73,108)/   |                 |                 |                 | DATA 230 |
| 243 | 251 | 9.9465124E-01,              | 9.9492855E-01,  | 9.9520691E-01,  | 9.9548610E-01,  | DATA 231 |
| 244 | 252 | 9.9576583E-01,              | 9.9604581E-01,  | 9.9632572E-01,  | 9.9660555E-01,  | DATA 232 |
| 245 | 253 | 9.9688523E-01,              | 9.9716472E-01,  | 9.9744400E-01,  | 9.9772313E-01,  | DATA 233 |
| 246 | 254 | 9.9800222E-01,              | 9.9828133E-01,  | 9.9856058E-01,  | 9.9884015E-01,  | DATA 234 |
| 247 | 255 | 9.9912018E-01,              | 9.9940088E-01,  | 9.9968232E-01,  | 9.9996477E-01,  | DATA 235 |
| 248 | 256 | 1.0002484E 00,              | 1.0005333E 00,  | 1.0008198E 00,  | 1.0011076E 00,  | DATA 236 |
| 249 | 257 | 1.0013967E 00,              | 1.0016867E 00,  | 1.0019777E 00,  | 1.0022692E 00,  | DATA 237 |
| 250 | 258 | 1.0025607E 00,              | 1.0028519E 00,  | 1.0031422E 00,  | 1.0034313E 00,  | DATA 238 |
| 251 | 259 | 1.0037189E 00,              | 1.0040047E 00,  | 1.0042853E 00,  | 1.0045696E 00,  | DATA 239 |
| 252 |     | DATA (RSUN (1),I=109,144)/  |                 |                 |                 | DATA 240 |
| 253 | 261 | 1.0048485E 00,              | 1.0051248E 00,  | 1.0053985E 00,  | 1.0056695E 00,  | DATA 241 |
| 254 | 262 | 1.0059379E 00,              | 1.0062037E 00,  | 1.0064670E 00,  | 1.0067279E 00,  | DATA 242 |
| 255 | 263 | 1.0069865E 00,              | 1.0072431E 00,  | 1.0074977E 00,  | 1.0077507E 00,  | DATA 243 |
| 256 | 264 | 1.0080022E 00,              | 1.0082525E 00,  | 1.0085019E 00,  | 1.0087503E 00,  | DATA 244 |
| 257 | 265 | 1.0089978E 00,              | 1.0092443E 00,  | 1.0094900E 00,  | 1.0097343E 00,  | DATA 245 |
| 258 | 266 | 1.0099769E 00,              | 1.0102174E 00,  | 1.0104635E 00,  | 1.0106907E 00,  | DATA 246 |
| 259 | 267 | 1.0109228E 00,              | 1.0111514E 00,  | 1.0113761E 00,  | 1.0115967E 00,  | DATA 247 |
| 260 | 268 | 1.0116131E 00,              | 1.0120251E 00,  | 1.0122325E 00,  | 1.0124353E 00,  | DATA 248 |
| 261 | 269 | 1.0126335E 00,              | 1.0128270E 00,  | 1.0130159E 00,  | 1.0132003E 00,  | DATA 249 |
| 262 |     | DATA (RSUN (1),I=145,180)/  |                 |                 |                 | DATA 250 |



|     |                               |                |                |                |                |          |
|-----|-------------------------------|----------------|----------------|----------------|----------------|----------|
| 263 | 271                           | 1.0133802E 00, | 1.0133560E 00, | 1.0137275E 00, | 1.0138953E 00, | DATA 251 |
| 264 | 272                           | 1.0140395E 00, | 1.0142205E 00, | 1.0143784E 00, | 1.0145336E 00, | DATA 252 |
| 265 | 273                           | 1.0146860E 00, | 1.0148359E 00, | 1.0149836E 00, | 1.0151286E 00, | DATA 253 |
| 266 | 274                           | 1.0152707E 00, | 1.0154097E 00, | 1.0155452E 00, | 1.0156770E 00, | DATA 254 |
| 267 | 275                           | 1.0158046E 00, | 1.0159279E 00, | 1.0160462E 00, | 1.0161596E 00, | DATA 255 |
| 268 | 276                           | 1.0162678E 00, | 1.0163705E 00, | 1.0164677E 00, | 1.0165592E 00, | DATA 256 |
| 269 | 277                           | 1.0166449E 00, | 1.0167247E 00, | 1.0167987E 00, | 1.0168670E 00, | DATA 257 |
| 270 | 278                           | 1.0169296E 00, | 1.0169867E 00, | 1.0170383E 00, | 1.0170847E 00, | DATA 258 |
| 271 | 279                           | 1.0171264E 00, | 1.0171636E 00, | 1.0171965E 00, | 1.0172254E 00, | DATA 259 |
| 272 | DATA (RSUN (I), I=181, 216, / |                |                |                |                | DATA 260 |
| 273 | 281                           | 1.0172507E 00, | 1.0172723E 00, | 1.0172914E 00, | 1.0173070E 00, | DATA 261 |
| 274 | 282                           | 1.0173195E 00, | 1.0173282E 00, | 1.0173339E 00, | 1.0173349E 00, | DATA 262 |
| 275 | 283                           | 1.0173322E 00, | 1.0173251E 00, | 1.0173132E 00, | 1.0172963E 00, | DATA 263 |
| 276 | 284                           | 1.0172743E 00, | 1.0172469E 00, | 1.0172139E 00, | 1.0171751E 00, | DATA 264 |
| 277 | 285                           | 1.0171305E 00, | 1.0170801E 00, | 1.0170235E 00, | 1.0169611E 00, | DATA 265 |
| 278 | 286                           | 1.0168928E 00, | 1.0168186E 00, | 1.0167358E 00, | 1.0166535E 00, | DATA 266 |
| 279 | 287                           | 1.0165631E 00, | 1.0164680E 00, | 1.0163683E 00, | 1.0162645E 00, | DATA 267 |
| 280 | 288                           | 1.0161569E 00, | 1.0160459E 00, | 1.0159319E 00, | 1.0158149E 00, | DATA 268 |
| 281 | 289                           | 1.0156950E 00, | 1.0155722E 00, | 1.0154466E 00, | 1.0153179E 00, | DATA 269 |
| 282 | DATA (RSUN (I), I=217, 252, / |                |                |                |                | DATA 270 |
| 283 | 291                           | 1.0151859E 00, | 1.0150505E 00, | 1.0149114E 00, | 1.0147684E 00, | DATA 271 |
| 284 | 292                           | 1.0146212E 00, | 1.0144698E 00, | 1.0143139E 00, | 1.0141533E 00, | DATA 272 |
| 285 | 293                           | 1.0139878E 00, | 1.0138173E 00, | 1.0136421E 00, | 1.0134617E 00, | DATA 273 |
| 286 | 294                           | 1.0132762E 00, | 1.0130857E 00, | 1.0128902E 00, | 1.0126901E 00, | DATA 274 |
| 287 | 295                           | 1.0124856E 00, | 1.0122770E 00, | 1.0120645E 00, | 1.0118487E 00, | DATA 275 |
| 288 | 296                           | 1.0116300E 00, | 1.0114086E 00, | 1.0111852E 00, | 1.0109598E 00, | DATA 276 |
| 289 | 297                           | 1.0107327E 00, | 1.0105039E 00, | 1.0102738E 00, | 1.0100423E 00, | DATA 277 |
| 290 | 298                           | 1.0098091E 00, | 1.0095743E 00, | 1.0093376E 00, | 1.0090990E 00, | DATA 278 |
| 291 | 299                           | 1.0088582E 00, | 1.0086152E 00, | 1.0083696E 00, | 1.0081215E 00, | DATA 279 |
| 292 | DATA (RSUN (I), I=253, 288, / |                |                |                |                | DATA 280 |
| 293 | 301                           | 1.0078705E 00, | 1.0076165E 00, | 1.0073595E 00, | 1.0070993E 00, | DATA 281 |
| 294 | 302                           | 1.0068358E 00, | 1.0065691E 00, | 1.0062939E 00, | 1.0060258E 00, | DATA 282 |
| 295 | 303                           | 1.0057498E 00, | 1.0054713E 00, | 1.0051904E 00, | 1.0049077E 00, | DATA 283 |
| 296 | 304                           | 1.0046235E 00, | 1.0043384E 00, | 1.0040527E 00, | 1.0037668E 00, | DATA 284 |
| 297 | 305                           | 1.0034809E 00, | 1.0031953E 00, | 1.0029103E 00, | 1.0026259E 00, | DATA 285 |
| 298 | 306                           | 1.0023422E 00, | 1.0020591E 00, | 1.0017766E 00, | 1.0014946E 00, | DATA 286 |
| 299 | 307                           | 1.0012130E 00, | 1.0009318E 00, | 1.0006507E 00, | 1.0003697E 00, | DATA 287 |
| 300 | 308                           | 1.0000884E 00, | 9.9980687E-01, | 9.9952486E-01, | 9.9924222E-01, | DATA 288 |
| 301 | 309                           | 9.9895880E-01, | 9.9867449E-01, | 9.9838908E-01, | 9.9810283E-01, | DATA 289 |
| 302 | DATA (RSUN (I), I=289, 324, / |                |                |                |                | DATA 290 |
| 303 | 311                           | 9.9781586E-01, | 9.9752840E-01, | 9.9724048E-01, | 9.9695267E-01, | DATA 291 |
| 304 | 312                           | 9.9666534E-01, | 9.9637894E-01, | 9.9609399E-01, | 9.9581074E-01, | DATA 292 |
| 305 | 313                           | 9.9552953E-01, | 9.9525069E-01, | 9.9497463E-01, | 9.9470139E-01, | DATA 293 |
| 306 | 314                           | 9.9443110E-01, | 9.9416386E-01, | 9.9389976E-01, | 9.9363878E-01, | DATA 294 |
| 307 | 315                           | 9.9338084E-01, | 9.9312590E-01, | 9.9287389E-01, | 9.9262463E-01, | DATA 295 |
| 308 | 316                           | 9.9237800E-01, | 9.9213383E-01, | 9.9189203E-01, | 9.9165231E-01, | DATA 296 |
| 309 | 317                           | 9.9141444E-01, | 9.9117826E-01, | 9.9094348E-01, | 9.9071021E-01, | DATA 297 |
| 310 | 318                           | 9.9047843E-01, | 9.9024820E-01, | 9.9001942E-01, | 9.8979261E-01, | DATA 298 |
| 311 | 319                           | 9.8956811E-01, | 9.8934630E-01, | 9.8912764E-01, | 9.8891243E-01, | DATA 299 |
| 312 | DATA (RSUN (I), I=325, 360, / |                |                |                |                | DATA 300 |
| 313 | 321                           | 9.8870100E-01, | 9.8849371E-01, | 9.8829099E-01, | 9.8809293E-01, | DATA 301 |
| 314 | 322                           | 9.8789973E-01, | 9.8771154E-01, | 9.8752852E-01, | 9.8735067E-01, | DATA 302 |
| 315 | 323                           | 9.8717802E-01, | 9.8701055E-01, | 9.8684821E-01, | 9.8669089E-01, | DATA 303 |
| 316 | 324                           | 9.8653847E-01, | 9.8639079E-01, | 9.8624777E-01, | 9.8610909E-01, | DATA 304 |
| 317 | 325                           | 9.8597445E-01, | 9.8584363E-01, | 9.8571635E-01, | 9.8559248E-01, | DATA 305 |
| 318 | 326                           | 9.8547184E-01, | 9.8535437E-01, | 9.8523971E-01, | 9.8512830E-01, | DATA 306 |
| 319 | 327                           | 9.8502037E-01, | 9.8491621E-01, | 9.8481610E-01, | 9.8472034E-01, | DATA 307 |
| 320 | 328                           | 9.8462930E-01, | 9.8454326E-01, | 9.8446269E-01, | 9.8438767E-01, | DATA 308 |
| 321 | 329                           | 9.8431846E-01, | 9.8425519E-01, | 9.8419808E-01, | 9.8414715E-01, | DATA 309 |
| 322 | DATA (RSUN (I), I=361, 368, / |                |                |                |                | DATA 310 |
| 323 | 331                           | 9.8410247E-01, | 9.8406408E-01, | 9.8403196E-01, | 9.8400604E-01, | DATA 311 |
| 324 | 332                           | 9.8398619E-01, | 9.8397227E-01, | 9.8396423E-01, | 9.8396168E-01, | DATA 312 |
| 325 | DATA (RAMOON(I), I= 1, 36, /  |                |                |                |                | DATA 312 |
| 326 | 341                           | 6.3374125E-01, | 8.4266103E-01, | 1.0373101E 00, | 1.2776293E 00, | DATA 313 |
| 327 | 342                           | 1.5025335E 00, | 1.7301607E 00, | 1.9583767E 00, | 2.1853922E 00, | DATA 314 |
| 328 | 343                           | 2.4102743E 00, | 2.6331979E 00, | 2.8554234E 00, | 3.0790767E 00, | DATA 315 |
| 329 | 344                           | 3.3068056E 00, | 3.5413238E 00, | 3.7848039E 00, | 4.0381108E 00, | DATA 316 |
| 330 | 345                           | 4.3000468E 00, | 4.5670412E 00, | 4.8337620E 00, | 5.0946236E 00, | DATA 317 |
| 331 | 346                           | 5.3454223E 00, | 5.5842181E 00, | 5.8112465E 00, | 6.0282778E 00, | DATA 318 |
| 332 | 347                           | 6.2379101E 00, | 6.5983000E-01, | 6.9331132E-01, | 7.2676812E-01, | DATA 319 |
| 333 | 348                           | 7.7508259E-01, | 8.0701718E-01, | 8.4204201E-01, | 8.7264667E-01, | DATA 320 |
| 334 | 349                           | 1.6228112E 00, | 1.8816626E 00, | 2.1113293E 00, | 2.3465038E 00, | DATA 321 |
| 335 | DATA (RAMOON(I), I= 37, 72, / |                |                |                |                | DATA 322 |

|     |     |                             |                |                |                |          |
|-----|-----|-----------------------------|----------------|----------------|----------------|----------|
| 336 | 351 | 2.5686498E 00,              | 2.7961612E 00, | 3.0242845E 00, | 3.2548595E 00, | DATA 323 |
| 337 | 352 | 3.4899248E 00,              | 3.7312178E 00, | 3.9795706E 00, | 4.2344011E 00, | DATA 324 |
| 338 | 353 | 4.4934071E 00,              | 4.7328878E 00, | 5.0086501E 00, | 5.2571480E 00, | DATA 325 |
| 339 | 354 | 5.4962966E 00,              | 5.7256691E 00, | 5.9462007E 00, | 6.1596994E 00, | DATA 326 |
| 340 | 355 | 8.5209649E-02,              | 2.9141834E-01, | 4.9731596E-01, | 7.8477249E-01, | DATA 327 |
| 341 | 356 | 9.1922177E-01,              | 1.1295304E 00, | 1.3480312E 00, | 1.5763409E 00, | DATA 328 |
| 342 | 357 | 1.7956982E 00,              | 2.0231266E 00, | 2.2517859E 00, | 2.4812767E 00, | DATA 329 |
| 343 | 358 | 2.7118250E 00,              | 2.9442948E 00, | 3.1800166E 00, | 3.4204512E 00, | DATA 330 |
| 344 | 359 | 3.6667152E 00,              | 3.9190390E 00, | 4.1763165E 00, | 4.4359956E 00, | DATA 331 |
| 345 |     | DATA (RAMOON(I),I=73,108),  |                |                |                | DATA 332 |
| 346 | 361 | 4.6945062E 00,              | 4.9481499E 00, | 5.1940535E 00, | 5.4307455E 00, | DATA 333 |
| 347 | 362 | 5.6582050E 00,              | 5.8775403E 00, | 6.0905471E 00, | 1.6129730E-02, | DATA 334 |
| 348 | 363 | 2.2274916E-01,              | 4.2910893E-01, | 6.3675382E-01, | 8.4678347E-01, | DATA 335 |
| 349 | 364 | 1.0597936E 00,              | 1.2758763E 00, | 1.4947022E 00, | 1.7156922E 00, | DATA 336 |
| 350 | 365 | 1.9382564E 00,              | 2.1620501E 00, | 2.3871838E 00, | 2.6143371E 00, | DATA 337 |
| 351 | 366 | 2.8447465E 00,              | 3.0800485E 00, | 3.3219573E 00, | 3.5717572E 00, | DATA 338 |
| 352 | 367 | 3.8296520E 00,              | 4.0941574E 00, | 4.3619054E 00, | 4.6282270E 00, | DATA 339 |
| 353 | 368 | 4.8883662E 00,              | 5.1388109E 00, | 5.3779721E 00, | 5.6061133E 00, | DATA 340 |
| 354 | 369 | 5.8248218E 00,              | 6.0364007E 00, | 6.2433850E 00, | 1.6502686E-01, | DATA 341 |
| 355 |     | DATA (RAMOON(I),I=109,144), |                |                |                | DATA 342 |
| 356 | 371 | 3.6982074E-01,              | 5.7623813E-01, | 7.8535640E-01, | 9.9760924E-01, | DATA 343 |
| 357 | 372 | 1.2128036E 00,              | 1.4302503E 00, | 1.6490134E 00, | 1.8682349E 00, | DATA 344 |
| 358 | 373 | 2.0874513E 00,              | 2.3068260E 00, | 2.5272554E 00, | 2.7503468E 00, | DATA 345 |
| 359 | 374 | 2.9782756E 00,              | 3.2135084E 00, | 3.4583350E 00, | 3.7141522E 00, | DATA 346 |
| 360 | 375 | 3.9805620E 00,              | 4.2546435E 00, | 4.5310402E 00, | 4.8032643E 00, | DATA 347 |
| 361 | 376 | 5.0656927E 00,              | 5.3150668E 00, | 5.5307937E 00, | 5.7743350E 00, | DATA 348 |
| 362 | 377 | 5.9882995E 00,              | 6.1957368E 00, | 1.1647053E-01, | 3.1956012E-01, | DATA 349 |
| 363 | 378 | 5.2399828E-01,              | 7.3130791E-01, | 9.4223961E-01, | 1.1567261E 00, | DATA 350 |
| 364 | 379 | 1.3739654E 00,              | 1.5926728E 00, | 1.8114728E 00, | 2.0293315E 00, | DATA 351 |
| 365 |     | DATA (RAMOON(I),I=145,180), |                |                |                | DATA 352 |
| 366 | 381 | 2.2459050E 00,              | 2.4617239E 00, | 2.6782119E 00, | 2.8975759E 00, | DATA 353 |
| 367 | 382 | 3.1225943E 00,              | 3.3362765E 00, | 3.6013079E 00, | 3.8591935E 00, | DATA 354 |
| 368 | 383 | 4.1291890E 00,              | 4.4075151E 00, | 4.6876837E 00, | 4.9623026E 00, | DATA 355 |
| 369 | 384 | 5.2254637E 00,              | 5.4742199E 00, | 5.7085738E 00, | 5.9305639E 00, | DATA 356 |
| 370 | 385 | 6.1432440E 00,              | 6.6759186E-02, | 2.7064470E-01, | 4.7445879E-01, | DATA 357 |
| 371 | 386 | 6.8032835E-01,              | 8.8963992E-01, | 1.1026919E 00, | 1.3196847E 00, | DATA 358 |
| 372 | 387 | 1.5388595E 00,              | 1.7583345E 00, | 1.9780767E 00, | 2.1955679E 00, | DATA 359 |
| 373 | 388 | 2.4111311E 00,              | 2.6255556E 00, | 2.8405487E 00, | 3.0585698E 00, | DATA 360 |
| 374 | 389 | 3.2825746E 00,              | 3.5156325E 00, | 3.7603255E 00, | 4.0178445E 00, | DATA 361 |
| 375 |     | DATA (RAMOON(I),I=181,216), |                |                |                | DATA 362 |
| 376 | 391 | 4.2870731E 00,              | 4.5637922E 00, | 4.8414705E 00, | 5.1130806E 00, | DATA 363 |
| 377 | 392 | 5.3733276E 00,              | 5.6198190E 00, | 5.9528731E 00, | 6.0746053E 00, | DATA 364 |
| 378 | 393 | 4.8065819E-03,              | 2.1302172E-01, | 4.1903983E-01, | 6.2539311E-01, | DATA 365 |
| 379 | 394 | 8.3399497E-01,              | 1.0459930E 00, | 1.2613723E 00, | 1.4804696E 00, | DATA 366 |
| 380 | 395 | 1.7011599E 00,              | 1.9222214E 00, | 2.1422963E 00, | 2.3606085E 00, | DATA 367 |
| 381 | 396 | 2.5772239E 00,              | 2.7931163E 00, | 3.0100736E 00, | 3.2304952E 00, | DATA 368 |
| 382 | 397 | 3.4370927E 00,              | 3.6924379E 00, | 3.9384435E 00, | 4.1953756E 00, | DATA 369 |
| 383 | 398 | 4.4613445E 00,              | 4.7320786E 00, | 5.0018338E 00, | 5.2650706E 00, | DATA 370 |
| 384 | 399 | 5.5179982E 00,              | 5.7591947E 00, | 5.9892931E 00, | 6.2102552E 00, | DATA 371 |
| 385 |     | DATA (RAMOON(I),I=217,252), |                |                |                | DATA 372 |
| 386 | 401 | 1.4145909E-01,              | 3.5195345E-01, | 5.6101435E-01, | 7.7068027E-01, | DATA 373 |
| 387 | 402 | 9.8241682E-01,              | 1.1570102E 00, | 1.4145291E 00, | 1.6343973E 00, | DATA 374 |
| 388 | 403 | 1.3856075E 00,              | 2.0770497E 00, | 2.2978761E 00, | 2.5177972E 00, | DATA 375 |
| 389 | 404 | 2.7372397E 00,              | 2.9573479E 00, | 3.1798510E 00, | 3.4068188E 00, | DATA 376 |
| 390 | 405 | 3.6403061E 00,              | 3.8818736E 00, | 4.1320140E 00, | 4.3896322E 00, | DATA 377 |
| 391 | 406 | 4.6518757E 00,              | 4.9146001E 00, | 5.1734290E 00, | 5.4249203E 00, | DATA 378 |
| 392 | 407 | 5.6672691E 00,              | 5.9003450E 00, | 6.1252781E 00, | 6.3731572E-02, | DATA 379 |
| 393 | 408 | 2.7518034E-01,              | 4.8746873E-01, | 6.9933536E-01, | 9.1209045E-01, | DATA 380 |
| 394 | 409 | 1.1265348E 00,              | 1.3429450E 00, | 1.5611345E 00, | 1.7806022E 00, | DATA 381 |
| 395 |     | DATA (RAMOON(I),I=253,288), |                |                |                | DATA 382 |
| 396 | 411 | 2.0007543E 00,              | 2.2211536E 00, | 2.4417374E 00, | 2.6629525E 00, | DATA 383 |
| 397 | 412 | 2.8857807E 00,              | 3.1116483E 00, | 3.3422177E 00, | 3.5790572E 00, | DATA 384 |
| 398 | 413 | 3.8231962E 00,              | 4.0746272E 00, | 4.3319216E 00, | 4.5922185E 00, | DATA 385 |
| 399 | 414 | 4.8517566E 00,              | 5.1068221E 00, | 5.3546747E 00, | 5.5940373E 00, | DATA 386 |
| 400 | 415 | 5.8250539E 00,              | 6.0489103E 00, | 6.2673643E 00, | 1.9915400E-01, | DATA 387 |
| 401 | 416 | 4.1243865E-01,              | 6.2548453E-01, | 8.3928314E-01, | 1.0543183E 00, | DATA 388 |
| 402 | 417 | 1.2706009E 00,              | 1.4877863E 00, | 1.7053730E 00, | 1.9229300E 00, | DATA 389 |
| 403 | 418 | 2.1403171E 00,              | 2.3578440E 00, | 2.5763468E 00, | 2.7971735E 00, | DATA 390 |
| 404 | 419 | 3.0220784E 00,              | 3.2530096E 00, | 3.4917600E 00, | 3.7394872E 00, | DATA 391 |
| 405 |     | DATA (RAMOON(I),I=289,324), |                |                |                | DATA 392 |
| 406 | 421 | 3.9959512E 00,              | 4.2593170E 00, | 4.5258489E 00, | 4.7908046E 00, | DATA 393 |
| 407 | 422 | 5.0496915E 00,              | 5.2994349E 00, | 5.5388778E 00, | 5.7685787E 00, | DATA 394 |
| 408 | 423 | 5.9902459E 00,              | 6.2061456E 00, | 1.3545033E-01, | 3.4665461E-01, | DATA 395 |



|     |     |                               |                 |                 |                 |          |   |
|-----|-----|-------------------------------|-----------------|-----------------|-----------------|----------|---|
| 409 | 424 | 5.5824044E=01,                | 7.7127059E=01,  | 9.8613232E=01,  | 1.2025692E 00,  | DATA 396 |   |
| 410 | 425 | 1.4198388E 00,                | 1.6369856E 00,  | 1.8531717E 00,  | 2.8679810E 00,  | DATA 397 |   |
| 411 | 426 | 2.2816249E 00,                | 2.4950242E 00,  | 2.7097840E 00,  | 2.9280846E 00,  | DATA 398 |   |
| 412 | 427 | 3.1824917E 00,                | 3.3856446E 00,  | 3.6297478E 00,  | 3.8858156E 00,  | DATA 399 |   |
| 413 | 428 | 4.1527960E 00,                | 4.4270232E 00,  | 4.7026540E 00,  | 4.9732352E 00,  | DATA 400 |   |
| 414 | 429 | 5.2336886E 00,                | 5.4814894E 00,  | 5.7166604E 00,  | 5.9410172E 00,  | DATA 401 |   |
| 415 |     | DATA (RAMOON(I), I=325, 360), |                 |                 |                 | DATA 402 | 6 |
| 416 | 431 | 6.1572918E 00,                | 8.5274609E=02,  | 2.9411948E=01,  | 5.8295420E=01,  | DATA 403 |   |
| 417 | 432 | 7.1342885E=01,                | 9.2639601E=01,  | 1.1418599E 00,  | 1.3590612E 00,  | DATA 404 |   |
| 418 | 433 | 1.5767315E 00,                | 1.7934849E 00,  | 2.0082473E 00,  | 2.2205998E 00,  | DATA 405 |   |
| 419 | 434 | 2.4309618E 00,                | 2.6406166E 00,  | 2.8511260E 00,  | 3.0666785E 00,  | DATA 406 |   |
| 420 | 435 | 3.2888682E 00,                | 3.5213418E 00,  | 3.7607007E 00,  | 4.0260804E 00,  | DATA 407 |   |
| 421 | 436 | 4.2980682E 00,                | 4.5780817E 00,  | 4.8390544E 00,  | 5.1335973E 00,  | DATA 408 |   |
| 422 | 437 | 5.3961605E 00,                | 5.6443866E 00,  | 5.8793894E 00,  | 6.1029173E 00,  | DATA 409 |   |
| 423 | 438 | 3.5121412E=02,                | 2.4560557E=01,  | 4.5410031E=01,  | 6.6295116E=01,  | DATA 410 |   |
| 424 | 439 | 6.7375600E=01,                | 1.0872429E 00,  | 1.3032396E 00,  | 1.5267946E 00,  | DATA 411 |   |
| 425 |     | DATA (RAMOON(I), I=361, 368), |                 |                 |                 | DATA 412 | 6 |
| 426 | 441 | 1.7384779E 00,                | 1.9348151E 00,  | 2.1687339E 00,  | 2.3798948E 00,  | DATA 413 |   |
| 427 | 442 | 2.5888444E 00,                | 2.7970054E 00,  | 3.0065637E 00,  | 3.2253079E 00,  | DATA 414 |   |
| 428 |     | DATA (RAMOON(I), I= 1, 36),   |                 |                 |                 | DATA 414 | 6 |
| 429 | 451 | 2.3941814E=01,                | 2.8288982E=01,  | 3.1461320E=01,  | 3.3274873E=01,  | DATA 415 |   |
| 430 | 452 | 3.3581675E=01,                | 3.2298052E=01,  | 2.9427960E=01,  | 2.5072373E=01,  | DATA 416 |   |
| 431 | 453 | 1.9422226E=01,                | 1.2740117E=01,  | 5.3401637E=02,  | =2.4261065E=02, | DATA 417 |   |
| 432 | 454 | =1.0174763E=01,               | =1.7488377E=01, | =2.8917832E=01, | =2.900868E=01,  | DATA 418 |   |
| 433 | 455 | =3.2310575E=01,               | =3.3534154E=01, | =3.2555883E=01, | =2.9498773E=01, | DATA 419 |   |
| 434 | 456 | =2.4695083E=01,               | =1.8600813E=01, | =1.699759E=01,  | =4.4346984E=02, | DATA 420 |   |
| 435 | 457 | 2.8233433E=02,                | 9.7759636E=02,  | 1.6181987E=01,  | 2.1837133E=01,  | DATA 421 |   |
| 436 | 458 | 2.6556152E=01,                | 3.0162054E=01,  | 3.2485322E=01,  | 3.3374348E=01,  | DATA 422 |   |
| 437 | 459 | 3.2715802E=01,                | 3.0459979E=01,  | 2.8643454E=01,  | 2.1401615E=01,  | DATA 423 |   |
| 438 |     | DATA (RAMOON(I), I= 37, 72),  |                 |                 |                 | DATA 424 | 6 |
| 439 | 461 | 1.4967559E=01,                | 7.6590162E=02,  | =1.4160414E=03, | =8.0086512E=02, | DATA 425 |   |
| 440 | 462 | =1.5493120E=01,               | =2.2141873E=01, | =2.7521194E=01, | =3.3251115E=01, | DATA 426 |   |
| 441 | 463 | =3.3052260E=01,               | =3.2795028E=01, | =3.0530008E=01, | =2.6481008E=01, | DATA 427 |   |
| 442 | 464 | =2.1000927E=01,               | =1.4509277E=01, | =7.4340668E=02, | =1.7160722E=03, | DATA 428 |   |
| 443 | 465 | 6.9332831E=02,                | 1.3590782E=01,  | 1.9559417E=01,  | 2.4635133E=01,  | DATA 429 |   |
| 444 | 466 | 2.8640851E=01,                | 3.1420053E=01,  | 3.8836770E=01,  | 3.2782644E=01,  | DATA 430 |   |
| 445 | 467 | 3.1190319E=01,                | 2.8050530E=01,  | 2.8429511E=01,  | 1.7483238E=01,  | DATA 431 |   |
| 446 | 468 | 1.0465617E=01,                | 2.7279209E=02,  | =5.2930116E=02, | =1.3099543E=01, | DATA 432 |   |
| 447 | 469 | =2.0171003E=01,               | =2.6012252E=01, | =3.0208349E=01, | =3.2476687E=01, | DATA 433 |   |
| 448 |     | DATA (RAMOON(I), I= 73, 108), |                 |                 |                 | DATA 434 | 6 |
| 449 | 471 | =3.2703359E=01,               | =3.0950446E=01, | =2.7430586E=01, | =2.2459723E=01, | DATA 435 |   |
| 450 | 472 | =1.6406436E=01,               | =9.6515535E=02, | =2.5622062E=02, | 4.5221325E=02,  | DATA 436 |   |
| 451 | 473 | 1.1295843E=01,                | 1.7488946E=01,  | 2.2866657E=01,  | 2.7228195E=01,  | DATA 437 |   |
| 452 | 474 | 3.0406047E=01,                | 3.2266504E=01,  | 3.2711879E=01,  | 3.1684275E=01,  | DATA 438 |   |
| 453 | 475 | 2.9170671E=01,                | 2.5209661E=01,  | 1.9900758E=01,  | 1.8417094E=01,  | DATA 439 |   |
| 454 | 476 | 6.0205674E=02,                | =1.9250968E=02, | =9.9523083E=02, | =1.7510080E=01, | DATA 440 |   |
| 455 | 477 | =2.4015872E=01,               | =2.8937273E=01, | =3.1884837E=01, | =3.2682406E=01, | DATA 441 |   |
| 456 | 478 | =3.1383351E=01,               | =2.8227244E=01, | =2.8563586E=01, | =1.7779276E=01, | DATA 442 |   |
| 457 | 479 | =1.1251720E=01,               | =4.3287947E=02, | =2.6737377E=02, | =9.4676729E=02, | DATA 443 |   |
| 458 |     | DATA (RAMOON(I), I=109, 144), |                 |                 |                 | DATA 444 | 6 |
| 459 | 481 | 1.5787595E=01,                | 2.1389309E=01,  | 2.4052407E=01,  | 2.9586463E=01,  | DATA 445 |   |
| 460 | 482 | 3.1839166E=01,                | 3.2704078E=01,  | 3.2125542E=01,  | 3.8099467E=01,  | DATA 446 |   |
| 461 | 483 | 2.6670766E=01,                | 2.1930689E=01,  | 1.6018256E=01,  | 9.3293442E=02,  | DATA 447 |   |
| 462 | 484 | 1.5340365E=02,                | =6.4021390E=02, | =1.4204425E=01, | =2.1300780E=01, | DATA 448 |   |
| 463 | 485 | =2.7078837E=01,               | =3.0992521E=01, | =3.2689126E=01, | =3.2095405E=01, | DATA 449 |   |
| 464 | 486 | =2.9411615E=01,               | =2.5021605E=01, | =1.9378016E=01, | =1.2917251E=01, | DATA 450 |   |
| 465 | 487 | =6.0209260E=02,               | 9.8783205E=03,  | 7.8314264E=02,  | 1.4261658E=01,  | DATA 451 |   |
| 466 | 488 | 2.0047843E=01,                | 2.4972461E=01,  | 2.8835095E=01,  | 3.1463314E=01,  | DATA 452 |   |
| 467 | 489 | 3.2727263E=01,                | 3.2552980E=01,  | 3.0929080E=01,  | 2.7905184E=01,  | DATA 453 |   |
| 468 |     | DATA (RAMOON(I), I=145, 180), |                 |                 |                 | DATA 454 | 6 |
| 469 | 491 | 2.3583430E=01,                | 1.8108979E=01,  | 1.1665645E=01,  | 4.4811736E=02,  | DATA 455 |   |
| 470 | 492 | =3.1570829E=02,               | =1.0880038E=01, | =1.8219702E=01, | =2.4616846E=01, | DATA 456 |   |
| 471 | 493 | =2.9477637E=01,               | =3.2288926E=01, | =3.2758748E=01, | =3.0906223E=01, | DATA 457 |   |
| 472 | 494 | =2.7038850E=01,               | =2.1635648E=01, | =1.5213576E=01, | =8.2390331E=02, | DATA 458 |   |
| 473 | 495 | =1.0959719E=02,               | 5.9082126E=02,  | 1.2321289E=01,  | 1.8523888E=01,  | DATA 459 |   |
| 474 | 496 | 2.3713703E=01,                | 2.7899447E=01,  | 3.0905220E=01,  | 3.2583766E=01,  | DATA 460 |   |
| 475 | 497 | 3.2834364E=01,                | 3.1618867E=01,  | 2.8969595E=01,  | 2.4985973E=01,  | DATA 461 |   |
| 476 | 498 | 1.9823353E=01,                | 1.3679824E=01,  | 6.7882678E=02,  | =5.8220429E=03, | DATA 462 |   |
| 477 | 499 | =8.1149588E=02,               | =1.5429200E=01, | =2.2068730E=01, | =2.7514567E=01, | DATA 463 |   |
| 478 |     | DATA (RAMOON(I), I=181, 216), |                 |                 |                 | DATA 464 | 6 |
| 479 | 501 | =3.1242234E=01,               | =3.2830476E=01, | =3.2086342E=01, | =2.9115861E=01, | DATA 465 |   |
| 480 | 502 | =2.4289197E=01,               | =1.8123457E=01, | =1.155599E=01,  | =3.8599662E=02, | DATA 466 |   |
| 481 | 503 | 3.3803960E=02,                | 1.0266320E=01,  | 1.8559978E=01,  | 2.2061455E=01,  | DATA 467 |   |
| 482 | 504 | 2.6591915E=01,                | 2.9986722E=01,  | 3.2099329E=01,  | 3.2814234E=01,  | DATA 468 |   |

|     |                             |                 |                 |                 |                 |          |          |
|-----|-----------------------------|-----------------|-----------------|-----------------|-----------------|----------|----------|
| 483 | 505                         | 3.2064688E=01,  | 2.9848696E=01,  | 2.6237212E=01,  | 2.8371877E=01,  | DATA 469 |          |
| 484 | 506                         | 1.5454553E=01,  | 8.7342532E=02,  | 1.4972156E=02,  | 5.9363275E=02,  | DATA 470 |          |
| 485 | 507                         | -1.3208791E=01, | -1.9919928E=01, | -2.5629510E=01, | -2.9882326E=01, | DATA 471 |          |
| 486 | 508                         | -3.2267794E=01, | -3.2509413E=01, | -3.0550028E=01, | -2.6503283E=01, | DATA 472 |          |
| 487 | 509                         | -2.1007651E=01, | -1.4328767E=01, | -7.0603713E=02, | 3.4118697E=03,  | DATA 473 |          |
| 488 | DATA (BCMOON(I),I=217,252)/ |                 |                 |                 |                 |          | DATA 474 |
| 489 | 511                         | 7.5025371E=02,  | 1.4130146E=01,  | 1.9993326E=01,  | 2.4904889E=01,  | DATA 475 |          |
| 490 | 512                         | 2.8706442E=01,  | 3.1261674E=01,  | 3.2458629E=01,  | 3.2219485E=01,  | DATA 476 |          |
| 491 | 513                         | 3.0514495E=01,  | 2.7375272E=01,  | 2.2903222E=01,  | 1.7271018E=01,  | DATA 477 |          |
| 492 | 514                         | 1.0717646E=01,  | 3.5394302E=02,  | 3.9201530E=02,  | 1.1280153E=01,  | DATA 478 |          |
| 493 | 515                         | -1.8131744E=01, | -2.4051444E=01, | -2.8624577E=01, | -3.3485461E=01, | DATA 479 |          |
| 494 | 516                         | -3.2373584E=01, | -3.1190621E=01, | -2.8032295E=01, | -2.3175862E=01, | DATA 480 |          |
| 495 | 517                         | -1.7027199E=01, | -1.0050713E=01, | -2.7068982E=01, | 4.5891636E=02,  | DATA 481 |          |
| 496 | 518                         | 1.1486891E=01,  | 1.7702266E=01,  | 2.8010078E=01,  | 2.7232992E=01,  | DATA 482 |          |
| 497 | 519                         | 3.0232119E=01,  | 3.1901847E=01,  | 3.2169726E=01,  | 3.1000722E=01,  | DATA 483 |          |
| 498 | DATA (BCMOON(I),I=253,288)/ |                 |                 |                 |                 |          | DATA 484 |
| 499 | 521                         | 2.8404371E=01,  | 2.4443078E=01,  | 1.9240227E=01,  | 1.2987038E=01,  | DATA 485 |          |
| 500 | 522                         | 5.9469211E=02,  | 1.5446650E=02,  | 9.0874738E=02,  | 1.4232971E=01,  | DATA 486 |          |
| 501 | 523                         | -2.2513532E=01, | -2.7482534E=01, | -3.0765666E=01, | -3.2113384E=01, | DATA 487 |          |
| 502 | 524                         | -3.1440562E=01, | -2.8836906E=01, | -2.4543659E=01, | -1.8907408E=01, | DATA 488 |          |
| 503 | 525                         | -1.2329150E=01, | -5.2220603E=02, | -2.0178008E=02, | 9.8294413E=02,  | DATA 489 |          |
| 504 | 526                         | 1.5496839E=01,  | 2.1153490E=01,  | 2.5783554E=01,  | 2.9221019E=01,  | DATA 490 |          |
| 505 | 527                         | 3.1347830E=01,  | 3.2091567E=01,  | 3.1422926E=01,  | 2.9353420E=01,  | DATA 491 |          |
| 506 | 528                         | 2.5954340E=01,  | 2.1258632E=01,  | 1.5467226E=01,  | 8.7603095E=02,  | DATA 492 |          |
| 507 | 529                         | 1.4115891E=02,  | 6.2197011E=02,  | 1.3687831E=01,  | 2.0481256E=01,  | DATA 493 |          |
| 508 | DATA (BCMOON(I),I=289,324)/ |                 |                 |                 |                 |          | DATA 494 |
| 509 | 531                         | -2.6072167E=01, | -2.9993275E=01, | -3.1922429E=01, | -3.1743186E=01, | DATA 495 |          |
| 510 | 532                         | -2.9553200E=01, | -2.5619163E=01, | -2.0305560E=01, | -1.4010093E=01, | DATA 496 |          |
| 511 | 533                         | -7.1228997E=02, | -8.6891755E=05, | 6.9975595E=02,  | 1.3590348E=01,  | DATA 497 |          |
| 512 | 534                         | 1.9494548E=01,  | 2.4469545E=01,  | 2.8316314E=01,  | 3.0885329E=01,  | DATA 498 |          |
| 513 | 535                         | 3.2082491E=01,  | 3.1870430E=01,  | 3.0264306E=01,  | 2.7323539E=01,  | DATA 499 |          |
| 514 | 536                         | 2.3143432E=01,  | 1.7850262E=01,  | 1.1604885E=01,  | 4.6150207E=02,  | DATA 500 |          |
| 515 | 537                         | -2.8443261E=02, | -1.0408600E=01, | -1.7611915E=01, | -2.3904268E=01, | DATA 501 |          |
| 516 | 538                         | -2.8715460E=01, | -3.1565491E=01, | -3.2185111E=01, | -3.8583603E=01, | DATA 502 |          |
| 517 | 539                         | -2.7022816E=01, | -2.1919165E=01, | -1.5735213E=01, | -8.9069691E=02, | DATA 503 |          |
| 518 | DATA (BCMOON(I),I=325,360)/ |                 |                 |                 |                 |          | DATA 504 |
| 519 | 541                         | -1.8152017E=02, | 5.2137438E=02,  | 1.1895228E=01,  | 1.7973692E=01,  | DATA 505 |          |
| 520 | 542                         | 2.3216368E=01,  | 2.7415446E=01,  | 3.0397641E=01,  | 3.2037460E=01,  | DATA 506 |          |
| 521 | 543                         | 3.2268826E=01,  | 3.1089767E=01,  | 2.8557808E=01,  | 2.4778102E=01,  | DATA 507 |          |
| 522 | 544                         | 1.9889790E=01,  | 1.4056760E=01,  | 7.4673715E=02,  | 3.4510786E=03,  | DATA 508 |          |
| 523 | 545                         | -7.0308548E=02, | -1.4300513E=01, | -2.1005645E=01, | -2.6601456E=01, | DATA 509 |          |
| 524 | 546                         | -3.0521986E=01, | -3.2304848E=01, | -3.1732607E=01, | -2.8907589E=01, | DATA 510 |          |
| 525 | 547                         | -2.4206868E=01, | -1.8152012E=01, | -1.1277186E=01, | -4.8507074E=02, | DATA 511 |          |
| 526 | 548                         | 3.1482899E=02,  | 1.0016496E=01,  | 1.4305790E=01,  | 2.1801990E=01,  | DATA 512 |          |
| 527 | 549                         | 2.6313603E=01,  | 2.9671190E=01,  | 3.1736263E=01,  | 3.2415695E=01,  | DATA 513 |          |
| 528 | DATA (BCMOON(I),I=361,369)/ |                 |                 |                 |                 |          | DATA 514 |
| 529 | 551                         | 3.1675394E=01,  | 2.9547041E=01,  | 2.6124607E=01,  | 2.1552427E=01,  | DATA 515 |          |
| 530 | 552                         | 1.6010400E=01,  | 9.7026602E=02,  | 2.8543608E=02,  | 4.2814964E=02,  | DATA 516 |          |
| 531 | DATA (RMOON(I),I=1,36)/     |                 |                 |                 |                 |          | DATA 516 |
| 532 | 561                         | 6.3499538E 01,  | 6.3480696E 01,  | 6.3301038E 01,  | 6.2990232E 01,  | DATA 517 |          |
| 533 | 562                         | 6.2981582E 01,  | 6.2108271E 01,  | 6.1599696E 01,  | 6.1078864E 01,  | DATA 518 |          |
| 534 | 563                         | 6.0961218E 01,  | 6.0055205E 01,  | 5.9564569E 01,  | 5.9091988E 01,  | DATA 519 |          |
| 535 | 564                         | 5.8643298E 01,  | 5.8231192E 01,  | 5.7877270E 01,  | 5.7611501E 01,  | DATA 520 |          |
| 536 | 565                         | 5.7468661E 01,  | 5.7482038E 01,  | 5.7675651E 01,  | 5.8057074E 01,  | DATA 521 |          |
| 537 | 566                         | 5.8613058E 01,  | 5.9309309E 01,  | 6.0094426E 01,  | 6.8906693E 01,  | DATA 522 |          |
| 538 | 567                         | 6.1681877E 01,  | 6.2360396E 01,  | 6.2892889E 01,  | 6.3243926E 01,  | DATA 523 |          |
| 539 | 568                         | 6.3393982E 01,  | 6.3339955E 01,  | 6.8094476E 01,  | 6.2684176E 01,  | DATA 524 |          |
| 540 | 569                         | 6.2146968E 01,  | 6.1528345E 01,  | 6.0876816E 01,  | 6.0238816E 01,  | DATA 525 |          |
| 541 | DATA (RMOON(I),I=37,72)/    |                 |                 |                 |                 |          | DATA 526 |
| 542 | 571                         | 5.9653768E 01,  | 5.9150217E 01,  | 5.8743931E 01,  | 5.8438536E 01,  | DATA 527 |          |
| 543 | 572                         | 5.8228568E 01,  | 5.8104201E 01,  | 5.8036297E 01,  | 5.8080406E 01,  | DATA 528 |          |
| 544 | 573                         | 5.8178585E 01,  | 5.8355565E 01,  | 5.8630455E 01,  | 5.9061876E 01,  | DATA 529 |          |
| 545 | 574                         | 5.9472901E 01,  | 6.0032231E 01,  | 6.0655642E 01,  | 6.1367066E 01,  | DATA 530 |          |
| 546 | 575                         | 6.1941910E 01,  | 6.2511781E 01,  | 6.2969631E 01,  | 6.3274673E 01,  | DATA 531 |          |
| 547 | 576                         | 6.3396196E 01,  | 6.3316810E 01,  | 6.3034346E 01,  | 6.2562853E 01,  | DATA 532 |          |
| 548 | 577                         | 6.1932413E 01,  | 6.1187615E 01,  | 6.0384600E 01,  | 5.9585494E 01,  | DATA 533 |          |
| 549 | 578                         | 5.8853309E 01,  | 5.8243045E 01,  | 5.7795231E 01,  | 5.7530902E 01,  | DATA 534 |          |
| 550 | 579                         | 5.7450090E 01,  | 5.7534892E 01,  | 5.7755535E 01,  | 5.8077979E 01,  | DATA 535 |          |
| 551 | DATA (RMOON(I),I=73,108)/   |                 |                 |                 |                 |          | DATA 536 |
| 552 | 581                         | 5.8470738E 01,  | 5.8909400E 01,  | 5.9378184E 01,  | 5.9868747E 01,  | DATA 537 |          |
| 553 | 582                         | 6.0376990E 01,  | 6.0898995E 01,  | 6.1427193E 01,  | 6.1947487E 01,  | DATA 538 |          |
| 554 | 583                         | 6.2439213E 01,  | 6.2873848E 01,  | 6.3219259E 01,  | 6.3442028E 01,  | DATA 539 |          |
| 555 | 584                         | 6.3511521E 01,  | 6.3403807E 01,  | 6.3105273E 01,  | 6.2615722E 01,  | DATA 540 |          |



|     |     |                              |     |            |     |            |     |            |     |      |     |
|-----|-----|------------------------------|-----|------------|-----|------------|-----|------------|-----|------|-----|
| 556 | 585 | 6,1950709E                   | 01, | 6,1142830E | 01, | 6,0241451E | 01, | 5,9310359E | 01, | DATA | 541 |
| 557 | 586 | 5,8422831E                   | 01, | 5,7653920E | 01, | 5,9070472E | 01, | 5,6720724E | 01, | DATA | 542 |
| 558 | 587 | 5,6626385E                   | 01, | 5,6779939E | 01, | 5,7148174E | 01, | 5,7680674E | 01, | DATA | 543 |
| 559 | 588 | 5,8320364E                   | 01, | 5,9013069E | 01, | 5,9714090E | 01, | 6,8391171E | 01, | DATA | 544 |
| 560 | 589 | 6,1024223E                   | 01, | 6,1602755E | 01, | 6,2122138E | 01, | 6,2579670E | 01, | DATA | 545 |
| 561 |     | DATA (RMOON (I), I=109,144)/ |     |            |     |            |     |            |     | DATA | 546 |
| 562 | 591 | 6,2971092E                   | 01, | 6,3288167E | 01, | 6,3517684E | 01, | 6,3641996E | 01, | DATA | 547 |
| 563 | 592 | 6,3640589E                   | 01, | 6,3494436E | 01, | 6,3186504E | 01, | 6,2708573E | 01, | DATA | 548 |
| 564 | 593 | 6,2063407E                   | 01, | 6,1268306E | 01, | 6,0357452E | 01, | 5,9382638E | 01, | DATA | 549 |
| 565 | 594 | 5,8611512E                   | 01, | 5,7522579E | 01, | 5,6796463E | 01, | 5,6304034E | 01, | DATA | 550 |
| 566 | 595 | 5,6093783E                   | 01, | 5,6182371E | 01, | 5,8551788E | 01, | 5,7154237E | 01, | DATA | 551 |
| 567 | 596 | 5,7922888E                   | 01, | 5,8784355E | 01, | 5,9669971E | 01, | 6,8523118E | 01, | DATA | 552 |
| 568 | 597 | 6,1302645E                   | 01, | 6,1982850E | 01, | 6,2551182E | 01, | 6,3004737E | 01, | DATA | 553 |
| 569 | 598 | 6,3346298E                   | 01, | 6,3580457E | 01, | 6,3710404E | 01, | 6,3735940E | 01, | DATA | 554 |
| 570 | 599 | 6,3652832E                   | 01, | 6,3453430E | 01, | 6,3128489E | 01, | 6,2670103E | 01, | DATA | 555 |
| 571 |     | DATA (RMOON (I), I=145,180)/ |     |            |     |            |     |            |     | DATA | 556 |
| 572 | 601 | 6,2075389E                   | 01, | 6,1350383E | 01, | 6,0513714E | 01, | 5,9599519E | 01, | DATA | 557 |
| 573 | 602 | 5,8658680E                   | 01, | 5,7757299E | 01, | 5,6971463E | 01, | 5,6377943E | 01, | DATA | 558 |
| 574 | 603 | 5,6041736E                   | 01, | 5,6003287E | 01, | 5,6269531E | 01, | 5,6812100E | 01, | DATA | 559 |
| 575 | 604 | 5,7573393E                   | 01, | 5,8478077E | 01, | 5,9446047E | 01, | 6,8403379E | 01, | DATA | 560 |
| 576 | 605 | 6,1289539E                   | 01, | 6,2060754E | 01, | 6,2690239E | 01, | 6,3166306E | 01, | DATA | 561 |
| 577 | 606 | 6,3489280E                   | 01, | 6,3667784E | 01, | 6,3714876E | 01, | 6,3644519E | 01, | DATA | 562 |
| 578 | 607 | 6,3468893E                   | 01, | 6,3196704E | 01, | 6,2832632E | 01, | 6,2378094E | 01, | DATA | 563 |
| 579 | 608 | 6,1833417E                   | 01, | 6,1201069E | 01, | 6,0489429E | 01, | 5,9716553E | 01, | DATA | 564 |
| 580 | 609 | 5,8913227E                   | 01, | 5,8124286E | 01, | 5,7407063E | 01, | 5,6826209E | 01, | DATA | 565 |
| 581 |     | DATA (RMOON (I), I=181,216)/ |     |            |     |            |     |            |     | DATA | 566 |
| 582 | 611 | 5,6444838E                   | 01, | 5,6313267E | 01, | 5,6458131E | 01, | 5,6875532E | 01, | DATA | 567 |
| 583 | 612 | 5,7530361E                   | 01, | 5,8362615E | 01, | 5,9297749E | 01, | 6,8258376E | 01, | DATA | 568 |
| 584 | 613 | 6,1172348E                   | 01, | 6,1982248E | 01, | 6,2645742E | 01, | 6,3137786E | 01, | DATA | 569 |
| 585 | 614 | 6,3449193E                   | 01, | 6,3584292E | 01, | 6,3557855E | 01, | 6,3391582E | 01, | DATA | 570 |
| 586 | 615 | 6,3110480E                   | 01, | 6,2739492E | 01, | 6,2300716E | 01, | 6,1811583E | 01, | DATA | 571 |
| 587 | 616 | 6,1284353E                   | 01, | 6,0727147E | 01, | 6,0146354E | 01, | 5,9549996E | 01, | DATA | 572 |
| 588 | 617 | 5,8951418E                   | 01, | 5,8372383E | 01, | 5,7944539E | 01, | 5,7408315E | 01, | DATA | 573 |
| 589 | 618 | 5,7108700E                   | 01, | 5,6988152E | 01, | 5,7077904E | 01, | 5,7390011E | 01, | DATA | 574 |
| 590 | 619 | 5,7912591E                   | 01, | 5,8609881E | 01, | 5,9427029E | 01, | 6,8297976E | 01, | DATA | 575 |
| 591 |     | DATA (RMOON (I), I=217,252)/ |     |            |     |            |     |            |     | DATA | 576 |
| 592 | 621 | 6,1154203E                   | 01, | 6,1932454E | 01, | 6,2580432E | 01, | 6,3060290E | 01, | DATA | 577 |
| 593 | 622 | 6,3350118E                   | 01, | 6,3443898E | 01, | 6,3350259E | 01, | 6,3090348E | 01, | DATA | 578 |
| 594 | 623 | 6,2694894E                   | 01, | 6,2200618E | 01, | 6,1646245E | 01, | 6,1068474E | 01, | DATA | 579 |
| 595 | 624 | 6,0498476E                   | 01, | 5,9959527E | 01, | 5,9466322E | 01, | 5,9026181E | 01, | DATA | 580 |
| 596 | 625 | 5,8641932E                   | 01, | 5,8315766E | 01, | 5,8052999E | 01, | 5,7864596E | 01, | DATA | 581 |
| 597 | 626 | 5,7767539E                   | 01, | 5,7782579E | 01, | 5,7929674E | 01, | 5,8222141E | 01, | DATA | 582 |
| 598 | 627 | 5,8661188E                   | 01, | 5,9232397E | 01, | 5,9905208E | 01, | 6,8635473E | 01, | DATA | 583 |
| 599 | 628 | 6,1370321E                   | 01, | 6,2054126E | 01, | 6,2634383E | 01, | 6,3066695E | 01, | DATA | 584 |
| 600 | 629 | 6,3318472E                   | 01, | 6,3371352E | 01, | 6,3222406E | 01, | 6,2884258E | 01, | DATA | 585 |
| 601 |     | DATA (RMOON (I), I=253,288)/ |     |            |     |            |     |            |     | DATA | 586 |
| 602 | 631 | 6,2384119E                   | 01, | 6,1761689E | 01, | 6,1065826E | 01, | 6,8349981E | 01, | DATA | 587 |
| 603 | 632 | 5,9666657E                   | 01, | 5,9061583E | 01, | 5,8568666E | 01, | 5,8206897E | 01, | DATA | 588 |
| 604 | 633 | 5,7980135E                   | 01, | 5,7879830E | 01, | 5,7889962E | 01, | 5,7992713E | 01, | DATA | 589 |
| 605 | 634 | 5,8173458E                   | 01, | 5,8423196E | 01, | 5,8738936E | 01, | 5,9121362E | 01, | DATA | 590 |
| 606 | 635 | 5,9570822E                   | 01, | 6,0083327E | 01, | 6,0647047E | 01, | 6,1240594E | 01, | DATA | 591 |
| 607 | 636 | 6,1833303E                   | 01, | 6,2387398E | 01, | 6,2861546E | 01, | 6,3215088E | 01, | DATA | 592 |
| 608 | 637 | 6,3412311E                   | 01, | 6,3426299E | 01, | 6,3242131E | 01, | 6,2859408E | 01, | DATA | 593 |
| 609 | 638 | 6,2293604E                   | 01, | 6,1376711E | 01, | 6,0756159E | 01, | 5,9892001E | 01, | DATA | 594 |
| 610 | 639 | 5,9051866E                   | 01, | 5,8303745E | 01, | 5,7707344E | 01, | 5,7305669E | 01, | DATA | 595 |
| 611 |     | DATA (RMOON (I), I=289,324)/ |     |            |     |            |     |            |     | DATA | 596 |
| 612 | 641 | 5,7119028E                   | 01, | 5,7143389E | 01, | 5,7353733E | 01, | 5,7711313E | 01, | DATA | 597 |
| 613 | 642 | 5,8172482E                   | 01, | 5,8696559E | 01, | 5,9251047E | 01, | 5,9813622E | 01, | DATA | 598 |
| 614 | 643 | 6,0371203E                   | 01, | 6,0915952E | 01, | 6,1446316E | 01, | 6,1953224E | 01, | DATA | 599 |
| 615 | 644 | 6,2427167E                   | 01, | 6,2851660E | 01, | 6,3204276E | 01, | 6,3458232E | 01, | DATA | 600 |
| 616 | 645 | 6,3585135E                   | 01, | 6,3558449E | 01, | 6,3557238E | 01, | 6,2970018E | 01, | DATA | 601 |
| 617 | 646 | 6,2397985E                   | 01, | 6,1658056E | 01, | 6,0784610E | 01, | 5,9829750E | 01, | DATA | 602 |
| 618 | 647 | 5,8861176E                   | 01, | 5,7956951E | 01, | 5,7196855E | 01, | 5,6651065E | 01, | DATA | 603 |
| 619 | 648 | 5,6368394E                   | 01, | 5,6367506E | 01, | 5,6634276E | 01, | 5,7126344E | 01, | DATA | 604 |
| 620 | 649 | 5,7783216E                   | 01, | 5,8538379E | 01, | 5,9329871E | 01, | 6,0107297E | 01, | DATA | 605 |
| 621 |     | DATA (RMOON (I), I=325,360)/ |     |            |     |            |     |            |     | DATA | 606 |
| 622 | 651 | 6,0834854E                   | 01, | 6,1490962E | 01, | 6,2065508E | 01, | 6,2555917E | 01, | DATA | 607 |
| 623 | 652 | 5,2962993E                   | 01, | 6,3281194E | 01, | 6,3525788E | 01, | 6,3671317E | 01, | DATA | 608 |
| 624 | 653 | 6,3711573E                   | 01, | 6,3630924E | 01, | 6,3412773E | 01, | 6,3042928E | 01, | DATA | 609 |
| 625 | 654 | 6,2513538E                   | 01, | 6,1827133E | 01, | 6,1000358E | 01, | 6,0066876E | 01, | DATA | 610 |
| 626 | 655 | 5,9078683E                   | 01, | 5,8104720E | 01, | 5,7225822E | 01, | 5,6525378E | 01, | DATA | 611 |
| 627 | 656 | 5,6076432E                   | 01, | 5,5927947E | 01, | 5,6094487E | 01, | 5,6553199E | 01, | DATA | 612 |
| 628 | 657 | 5,7249300E                   | 01, | 5,8107957E | 01, | 5,9048260E | 01, | 5,9995206E | 01, | DATA | 613 |

|     |                               |                |                |                 |                |          |
|-----|-------------------------------|----------------|----------------|-----------------|----------------|----------|
| 629 | 658                           | 6.0887559E 01, | 6.1681421E 01, | 6.2350293E 01,  | 6.2882745E 01, | DATA 614 |
| 630 | 659                           | 6.3278779E 01, | 6.3543711E 01, | 6.3694068E 01,  | 6.3733979E 01, | DATA 615 |
| 631 | DATA (RMOON (1), 17361, 368)/ |                |                |                 |                | DATA 616 |
| 632 | 661                           | 6.3672520E 01, | 6.3812275E 01, | 6.38251214E 01, | 6.2863934E 01, | DATA 617 |
| 633 | 662                           | 6.2404260E 01, | 6.1808866E 01, | 6.1101402E 01,  | 6.8296631E 01, | DATA 618 |
| 634 | END                           |                |                |                 |                | DATA 619 |

29748 WORDS OF MEMORY USED BY THIS COMPILATION

71034 02 11-03-72 11.778 1977 EPHEMERIS

## PREFACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

PRIMARY SYMDEF ENTRY

TABLE 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1 EPHBLK 11

SYMREF

END OF BINARY CARD \*1977\*19

4273 IS THE NEXT AVAILABLE LOCATION.

GMAP VERSION/ASSEMBLY DATES JMPA 110171/102971

JMPB 110171/102971

JMPC 110171/102971

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

\*\* 19411 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

71034 02 11-03-72 11.790 1978 EPHEMERIS

|    |                                                                  |                |                |                |                |      |    |
|----|------------------------------------------------------------------|----------------|----------------|----------------|----------------|------|----|
| 1  | C*1978*                                                          | 1978 EPHEMERIS | DATA           | 1              |                |      |    |
| 2  | SUBROUTINE TABLE                                                 |                |                | DATA           | 2              |      |    |
| 3  | DIMENSION RASUN (369), DCSUN (369), RSUN (369)                   |                |                | DATA           | 3              |      |    |
| 4  | DIMENSION RAMOON(369), DCMOON(369), RMOON(369)                   |                |                | DATA           | 4              |      |    |
| 5  | DIMENSION ARRAY(2214)                                            |                |                |                |                |      |    |
| 6  | DOUBLE PRECISION Y                                               |                |                |                |                |      |    |
| 7  | EQUIVALENCE (RASUN,ARRAY), (DCSUN,ARRAY(370)), (RSUN,ARRAY(739)) |                |                |                |                |      |    |
| 8  | EQUIVALENCE (RAMOON,ARRAY(1108)), (DCMOON,ARRAY(1477))           |                |                |                |                |      |    |
| 9  | EQUIVALENCE (RMOON,ARRAY(1846))                                  |                |                |                |                |      |    |
| 10 | COMMON /EPHBLK/ Y(4), I                                          |                |                |                |                |      |    |
| 11 | Y(1) = ARRAY(I)                                                  |                |                |                |                |      |    |
| 12 | Y(2) = ARRAY(I+1)                                                |                |                |                |                |      |    |
| 13 | Y(3) = ARRAY(I+2)                                                |                |                |                |                |      |    |
| 14 | Y(4) = ARRAY(I+3)                                                |                |                |                |                |      |    |
| 15 | RETURN                                                           |                |                |                |                |      |    |
| 16 | DATA (RASUN (1)), 1, 36)/                                        |                |                | DATA           | 6              |      |    |
| 17 | 11                                                               | 4.8869814E 00, | 4.9062641E 00, | 4.9255262E 00, | 4.9447657E 00, | DATA | 7  |
| 18 | 12                                                               | 4.9639806E 00, | 4.9831688E 00, | 5.0023281E 00, | 5.0214559E 00, | DATA | 8  |
| 19 | 13                                                               | 5.0405499E 00, | 5.0596079E 00, | 5.0786274E 00, | 5.0976061E 00, | DATA | 9  |
| 20 | 14                                                               | 5.1165418E 00, | 5.1354324E 00, | 5.1542763E 00, | 5.1730724E 00, | DATA | 10 |
| 21 | 15                                                               | 5.1918189E 00, | 5.2105143E 00, | 5.2291593E 00, | 5.2477490E 00, | DATA | 11 |
| 22 | 16                                                               | 5.2662858E 00, | 5.2847678E 00, | 5.3031941E 00, | 5.3213642E 00, | DATA | 12 |
| 23 | 17                                                               | 5.3396775E 00, | 5.3581336E 00, | 5.3763320E 00, | 5.3944725E 00, | DATA | 13 |
| 24 | 18                                                               | 5.4125551E 00, | 5.4305799E 00, | 5.4485461E 00, | 5.4664545E 00, | DATA | 14 |
| 25 | 19                                                               | 5.4843051E 00, | 5.5020982E 00, | 5.5198334E 00, | 5.5375106E 00, | DATA | 15 |
| 26 | DATA (RASUN (1)), 37, 72)/                                       |                |                | DATA           | 16             |      |    |
| 27 | 21                                                               | 5.5551302E 00, | 5.5726917E 00, | 5.5901931E 00, | 5.6076402E 00, | DATA | 17 |
| 28 | 22                                                               | 5.6250272E 00, | 5.6423560E 00, | 5.6596273E 00, | 5.6768416E 00, | DATA | 18 |
| 29 | 23                                                               | 5.6939992E 00, | 5.7111009E 00, | 5.7281475E 00, | 5.7451397E 00, | DATA | 19 |
| 30 | 24                                                               | 5.7620785E 00, | 5.7789646E 00, | 5.7957594E 00, | 5.8125537E 00, | DATA | 20 |
| 31 | 25                                                               | 5.8293188E 00, | 5.8460059E 00, | 5.8626463E 00, | 5.8792415E 00, | DATA | 21 |
| 32 | 26                                                               | 5.8957930E 00, | 5.9123023E 00, | 5.9287703E 00, | 5.9452002E 00, | DATA | 22 |
| 33 | 27                                                               | 5.9615921E 00, | 5.9779460E 00, | 5.9942691E 00, | 6.0105566E 00, | DATA | 23 |
| 34 | 28                                                               | 6.0268118E 00, | 6.0430360E 00, | 6.0592300E 00, | 6.0753951E 00, | DATA | 24 |

|     |     |                             |                |                |                |      |    |   |
|-----|-----|-----------------------------|----------------|----------------|----------------|------|----|---|
| 35  | 29  | 6.0915323E 00,              | 6.1076428E 00, | 6.1237279E 00, | 6.1397887E 00/ | DATA | 25 |   |
| 36  |     | DATA (RASUN I), I=73,108)/  |                |                |                | DATA | 26 | 6 |
| 37  | 31  | 6.1558267E 00,              | 6.1718430E 00, | 6.1878390E 00, | 6.2038160E 00, | DATA | 27 |   |
| 38  | 32  | 6.2197755E 00,              | 6.2357188E 00, | 6.2516477E 00, | 6.2675633E 00, | DATA | 28 |   |
| 39  | 33  | 6.2821051E-04,              | 1.6176224E-02, | 3.2062129E-02, | 4.7941566E-02, | DATA | 29 |   |
| 40  | 34  | 6.3816329E-02,              | 7.9688161E-02, | 9.3558970E-02, | 1.1143055E-01, | DATA | 30 |   |
| 41  | 35  | 1.2730463E-01,              | 1.4318299E-01, | 1.5906698E-01, | 1.7495801E-01, | DATA | 31 |   |
| 42  | 36  | 1.9085741E-01,              | 2.0676663E-01, | 2.2268673E-01, | 2.3861891E-01, | DATA | 32 |   |
| 43  | 37  | 2.5456428E-01,              | 2.7052403E-01, | 2.8649931E-01, | 3.0249112E-01, | DATA | 33 |   |
| 44  | 38  | 3.1850053E-01,              | 3.3452844E-01, | 3.5057594E-01, | 3.6664402E-01, | DATA | 34 |   |
| 45  | 39  | 3.8273375E-01,              | 3.9884609E-01, | 4.1498209E-01, | 4.3114285E-01/ | DATA | 35 |   |
| 46  |     | DATA (RASUN I), I=109,144)/ |                |                |                | DATA | 36 | 6 |
| 47  | 41  | 4.4732944E-01,              | 4.6354293E-01, | 4.7978436E-01, | 4.9605559E-01, | DATA | 37 |   |
| 48  | 42  | 5.1235723E-01,              | 5.2869067E-01, | 5.4505730E-01, | 5.6145833E-01, | DATA | 38 |   |
| 49  | 43  | 5.7789485E-01,              | 5.9436803E-01, | 6.1087861E-01, | 6.2742731E-01, | DATA | 39 |   |
| 50  | 44  | 6.4401485E-01,              | 6.6064206E-01, | 6.7730924E-01, | 6.9401688E-01, | DATA | 40 |   |
| 51  | 45  | 7.1076532E-01,              | 7.2755489E-01, | 7.4438573E-01, | 7.6125797E-01, | DATA | 41 |   |
| 52  | 46  | 7.7817155E-01,              | 7.9512636E-01, | 8.1212234E-01, | 8.2915932E-01, | DATA | 42 |   |
| 53  | 47  | 8.4623715E-01,              | 8.6335554E-01, | 8.8051434E-01, | 8.9771328E-01, | DATA | 43 |   |
| 54  | 48  | 9.1495212E-01,              | 9.3223060E-01, | 9.4954859E-01, | 9.6690594E-01, | DATA | 44 |   |
| 55  | 49  | 9.8430248E-01,              | 1.0017378E 00, | 1.0192121E 00, | 1.0367249E 00/ | DATA | 45 |   |
| 56  |     | DATA (RASUN I), I=149,180)/ |                |                |                | DATA | 46 | 6 |
| 57  | 51  | 1.0542761E 00,              | 1.0718653E 00, | 1.0894918E 00, | 1.1071549E 00, | DATA | 47 |   |
| 58  | 52  | 1.1248340E 00,              | 1.1425885E 00, | 1.1603574E 00, | 1.1781595E 00, | DATA | 48 |   |
| 59  | 53  | 1.1959939E 00,              | 1.2138593E 00, | 1.2317543E 00, | 1.2496775E 00, | DATA | 49 |   |
| 60  | 54  | 1.2676273E 00,              | 1.2856020E 00, | 1.3035999E 00, | 1.3216194E 00, | DATA | 50 |   |
| 61  | 55  | 1.3396587E 00,              | 1.3577161E 00, | 1.3757897E 00, | 1.3938778E 00, | DATA | 51 |   |
| 62  | 56  | 1.4119788E 00,              | 1.4300908E 00, | 1.4482123E 00, | 1.4663418E 00, | DATA | 52 |   |
| 63  | 57  | 1.4844777E 00,              | 1.5026183E 00, | 1.5207624E 00, | 1.5389086E 00, | DATA | 53 |   |
| 64  | 58  | 1.5570584E 00,              | 1.5752013E 00, | 1.5933449E 00, | 1.6114848E 00, | DATA | 54 |   |
| 65  | 59  | 1.6296194E 00,              | 1.6477476E 00, | 1.6658677E 00, | 1.6839781E 00/ | DATA | 55 |   |
| 66  |     | DATA (RASUN I), I=181,216)/ |                |                |                | DATA | 56 | 6 |
| 67  | 61  | 1.7020772E 00,              | 1.7201635E 00, | 1.7382331E 00, | 1.7562902E 00, | DATA | 57 |   |
| 68  | 62  | 1.7743269E 00,              | 1.7923436E 00, | 1.8103382E 00, | 1.8283092E 00, | DATA | 58 |   |
| 69  | 63  | 1.8462548E 00,              | 1.8641733E 00, | 1.8820632E 00, | 1.8999228E 00, | DATA | 59 |   |
| 70  | 64  | 1.9177507E 00,              | 1.9355437E 00, | 1.9533064E 00, | 1.9710319E 00, | DATA | 60 |   |
| 71  | 65  | 1.9887211E 00,              | 2.0063728E 00, | 2.0239866E 00, | 2.0415618E 00, | DATA | 61 |   |
| 72  | 66  | 2.0590976E 00,              | 2.0765933E 00, | 2.0940487E 00, | 2.1114634E 00, | DATA | 62 |   |
| 73  | 67  | 2.1288371E 00,              | 2.1461700E 00, | 2.1634616E 00, | 2.1807117E 00, | DATA | 63 |   |
| 74  | 68  | 2.1979202E 00,              | 2.2150869E 00, | 2.2322113E 00, | 2.2492931E 00, | DATA | 64 |   |
| 75  | 69  | 2.2663320E 00,              | 2.2833277E 00, | 2.3002799E 00, | 2.3171884E 00/ | DATA | 65 |   |
| 76  |     | DATA (RASUN I), I=217,252)/ |                |                |                | DATA | 66 | 6 |
| 77  | 71  | 2.3340530E 00,              | 2.3508736E 00, | 2.3676501E 00, | 2.3843825E 00, | DATA | 67 |   |
| 78  | 72  | 2.4010710E 00,              | 2.4177137E 00, | 2.4343169E 00, | 2.4508750E 00, | DATA | 68 |   |
| 79  | 73  | 2.4673904E 00,              | 2.4839634E 00, | 2.5002948E 00, | 2.5166854E 00, | DATA | 69 |   |
| 80  | 74  | 2.5330358E 00,              | 2.5493466E 00, | 2.5656191E 00, | 2.5818544E 00, | DATA | 70 |   |
| 81  | 75  | 2.5980536E 00,              | 2.6142184E 00, | 2.6303496E 00, | 2.6464486E 00, | DATA | 71 |   |
| 82  | 76  | 2.6625165E 00,              | 2.6785547E 00, | 2.6945639E 00, | 2.7105452E 00, | DATA | 72 |   |
| 83  | 77  | 2.7264996E 00,              | 2.7424279E 00, | 2.7583312E 00, | 2.7742104E 00, | DATA | 73 |   |
| 84  | 78  | 2.7900664E 00,              | 2.8059004E 00, | 2.8217133E 00, | 2.8375060E 00, | DATA | 74 |   |
| 85  | 79  | 2.8532797E 00,              | 2.8690356E 00, | 2.8847747E 00, | 2.9004981E 00/ | DATA | 75 |   |
| 86  |     | DATA (RASUN I), I=255,288)/ |                |                |                | DATA | 76 | 6 |
| 87  | 81  | 2.9162072E 00,              | 2.9319029E 00, | 2.9475867E 00, | 2.9632599E 00, | DATA | 77 |   |
| 88  | 82  | 2.9789239E 00,              | 2.9945800E 00, | 3.0102299E 00, | 3.0258755E 00, | DATA | 78 |   |
| 89  | 83  | 3.0415185E 00,              | 3.0571609E 00, | 3.0728046E 00, | 3.0884311E 00, | DATA | 79 |   |
| 90  | 84  | 3.1041024E 00,              | 3.1197602E 00, | 3.1354260E 00, | 3.1511011E 00, | DATA | 80 |   |
| 91  | 85  | 3.1667871E 00,              | 3.1824855E 00, | 3.1981975E 00, | 3.2139246E 00, | DATA | 81 |   |
| 92  | 86  | 3.2296681E 00,              | 3.2454294E 00, | 3.2612097E 00, | 3.2770104E 00, | DATA | 82 |   |
| 93  | 87  | 3.2928328E 00,              | 3.3086781E 00, | 3.3245476E 00, | 3.3404424E 00, | DATA | 83 |   |
| 94  | 88  | 3.3563638E 00,              | 3.3723128E 00, | 3.3882909E 00, | 3.4042991E 00, | DATA | 84 |   |
| 95  | 89  | 3.4203389E 00,              | 3.4364114E 00, | 3.4525184E 00, | 3.4686615E 00/ | DATA | 85 |   |
| 96  |     | DATA (RASUN I), I=289,324)/ |                |                |                | DATA | 86 | 6 |
| 97  | 91  | 3.4848424E 00,              | 3.5010627E 00, | 3.5173243E 00, | 3.5336286E 00, | DATA | 87 |   |
| 98  | 92  | 3.5499772E 00,              | 3.5663717E 00, | 3.5828132E 00, | 3.5993031E 00, | DATA | 88 |   |
| 99  | 93  | 3.6158425E 00,              | 3.6324326E 00, | 3.6490743E 00, | 3.6657688E 00, | DATA | 89 |   |
| 100 | 94  | 3.6825169E 00,              | 3.6993196E 00, | 3.7161777E 00, | 3.7330918E 00, | DATA | 90 |   |
| 101 | 95  | 3.7500627E 00,              | 3.7670910E 00, | 3.7841771E 00, | 3.8013212E 00, | DATA | 91 |   |
| 102 | 96  | 3.8185238E 00,              | 3.8357847E 00, | 3.8531044E 00, | 3.8704831E 00, | DATA | 92 |   |
| 103 | 97  | 3.8879209E 00,              | 3.9054179E 00, | 3.9229747E 00, | 3.9405518E 00, | DATA | 93 |   |
| 104 | 98  | 3.9582692E 00,              | 3.9760082E 00, | 3.9938082E 00, | 4.0116699E 00, | DATA | 94 |   |
| 105 | 99  | 4.0295931E 00,              | 4.0475782E 00, | 4.0656247E 00, | 4.0837325E 00/ | DATA | 95 |   |
| 106 |     | DATA (RASUN I), I=325,360)/ |                |                |                | DATA | 96 | 6 |
| 107 | 101 | 4.1019012E 00,              | 4.1201306E 00, | 4.1384199E 00, | 4.1567684E 00, | DATA | 97 |   |



|     |     |                               |                 |                 |                 |          |   |
|-----|-----|-------------------------------|-----------------|-----------------|-----------------|----------|---|
| 108 | 102 | 4.1751755E 00,                | 4.1936403E 00,  | 4.2121621E 00,  | 4.2307393E 00,  | DATA 98  |   |
| 109 | 103 | 4.2493709E 00,                | 4.2680537E 00,  | 4.2867919E 00,  | 4.3055778E 00,  | DATA 99  |   |
| 110 | 104 | 4.3244113E 00,                | 4.3432904E 00,  | 4.3622131E 00,  | 4.3811774E 00,  | DATA 100 |   |
| 111 | 105 | 4.4001813E 00,                | 4.4192226E 00,  | 4.4382996E 00,  | 4.4574106E 00,  | DATA 101 |   |
| 112 | 106 | 4.4765537E 00,                | 4.4957271E 00,  | 4.5149289E 00,  | 4.5341571E 00,  | DATA 102 |   |
| 113 | 107 | 4.5334098E 00,                | 4.5726849E 00,  | 4.5919803E 00,  | 4.6112939E 00,  | DATA 103 |   |
| 114 | 108 | 4.6306233E 00,                | 4.6499664E 00,  | 4.6693209E 00,  | 4.6886846E 00,  | DATA 104 |   |
| 115 | 109 | 4.7080550E 00,                | 4.7274299E 00,  | 4.7468067E 00,  | 4.7661832E 00,  | DATA 105 |   |
| 116 |     | DATA (RASUN (I), I=361,368),  |                 |                 |                 | DATA 106 | 6 |
| 117 | 111 | 4.7855567E 00,                | 4.8049251E 00,  | 4.8242853E 00,  | 4.8436344E 00,  | DATA 107 |   |
| 118 | 112 | 4.8629696E 00,                | 4.8822882E 00,  | 4.9015870E 00,  | 4.9208634E 00,  | DATA 108 |   |
| 119 |     | DATA (BCSUN (I), I=1, 36),    |                 |                 |                 | DATA 108 | 6 |
| 120 | 121 | =4.0353467E-01,               | =4.0223810E-01, | =4.0080747E-01, | =3.9924351E-01, | DATA 109 |   |
| 121 | 122 | =3.9754695E-01,               | =3.9571863E-01, | =3.9379955E-01, | =3.9167072E-01, | DATA 110 |   |
| 122 | 123 | =3.8945321E-01,               | =3.8710823E-01, | =3.8463690E-01, | =3.8204046E-01, | DATA 111 |   |
| 123 | 124 | =3.7932017E-01,               | =3.7647737E-01, | =3.7351337E-01, | =3.7042953E-01, | DATA 112 |   |
| 124 | 125 | =3.6722736E-01,               | =3.6390832E-01, | =3.6047401E-01, | =3.5692598E-01, | DATA 113 |   |
| 125 | 126 | =3.5326582E-01,               | =3.4949524E-01, | =3.4561587E-01, | =3.4162938E-01, | DATA 114 |   |
| 126 | 127 | =3.3753753E-01,               | =3.3334200E-01, | =3.2904439E-01, | =3.2464705E-01, | DATA 115 |   |
| 127 | 128 | =3.2015119E-01,               | =3.155874E-01,  | =3.1087163E-01, | =3.0609165E-01, | DATA 116 |   |
| 128 | 129 | =3.0122076E-01,               | =2.9526085E-01, | =2.9121399E-01, | =2.8608219E-01, | DATA 117 |   |
| 129 |     | DATA (BCSUN (I), I=37, 72),   |                 |                 |                 | DATA 118 | 6 |
| 130 | 131 | =2.8086757E-01,               | =2.7557213E-01, | =2.7019802E-01, | =2.6474728E-01, | DATA 119 |   |
| 131 | 132 | =2.5922205E-01,               | =2.5362443E-01, | =2.4795638E-01, | =2.4221997E-01, | DATA 120 |   |
| 132 | 133 | =2.3641725E-01,               | =2.3059028E-01, | =2.2462114E-01, | =2.1863175E-01, | DATA 121 |   |
| 133 | 134 | =2.1258424E-01,               | =2.0648053E-01, | =2.0032267E-01, | =1.9411256E-01, | DATA 122 |   |
| 134 | 135 | =1.8785220E-01,               | =1.8154354E-01, | =1.7518841E-01, | =1.6878877E-01, | DATA 123 |   |
| 135 | 136 | =1.6234645E-01,               | =1.5586333E-01, | =1.4934125E-01, | =1.4278208E-01, | DATA 124 |   |
| 136 | 137 | =1.3618769E-01,               | =1.2955993E-01, | =1.2290079E-01, | =1.1621222E-01, | DATA 125 |   |
| 137 | 138 | =1.0949620E-01,               | =1.0275463E-01, | =9.5989550E-02, | =8.9202914E-02, | DATA 126 |   |
| 138 | 139 | =8.2396669E-02,               | =7.5572761E-02, | =6.8733074E-02, | =6.1879493E-02, | DATA 127 |   |
| 139 |     | DATA (BCSUN (I), I=73, 108),  |                 |                 |                 | DATA 128 | 6 |
| 140 | 141 | =5.5013913E-02,               | =4.8138255E-02, | =4.1254341E-02, | =3.4364010E-02, | DATA 129 |   |
| 141 | 142 | =2.7469089E-02,               | =2.0371392E-02, | =1.3672695E-02, | =6.7747568E-03, | DATA 130 |   |
| 142 | 143 | =1.2067726E-02,               | =7.0118638E-03, | =1.3897149E-02, | =2.0774874E-02, | DATA 131 |   |
| 143 | 144 | =2.7643401E-02,               | =3.4501086E-02, | =4.1346350E-02, | =4.8177579E-02, | DATA 132 |   |
| 144 | 145 | =5.4993153E-02,               | =6.1791467E-02, | =6.8570793E-02, | =7.5329394E-02, | DATA 133 |   |
| 145 | 146 | =8.2065573E-02,               | =8.8777647E-02, | =9.5463813E-02, | =1.0212232E-01, | DATA 134 |   |
| 146 | 147 | =1.0875145E-01,               | =1.1534948E-01, | =1.2191458E-01, | =1.2844536E-01, | DATA 135 |   |
| 147 | 148 | =1.3493976E-01,               | =1.4139616E-01, | =1.4781288E-01, | =1.5418821E-01, | DATA 136 |   |
| 148 | 149 | =1.6052046E-01,               | =1.6680793E-01, | =1.7304903E-01, | =1.7924204E-01, | DATA 137 |   |
| 149 |     | DATA (BCSUN (I), I=109, 144), |                 |                 |                 | DATA 138 | 6 |
| 150 | 151 | =1.8538534E-01,               | =1.9147735E-01, | =1.9751644E-01, | =2.0350106E-01, | DATA 139 |   |
| 151 | 152 | =2.0942976E-01,               | =2.1530089E-01, | =2.2111308E-01, | =2.2686484E-01, | DATA 140 |   |
| 152 | 153 | =2.3255467E-01,               | =2.3818103E-01, | =2.4374245E-01, | =2.4923732E-01, | DATA 141 |   |
| 153 | 154 | =2.5466409E-01,               | =2.6002118E-01, | =2.6530704E-01, | =2.7052006E-01, | DATA 142 |   |
| 154 | 155 | =2.7565870E-01,               | =2.8072141E-01, | =2.8570670E-01, | =2.9061301E-01, | DATA 143 |   |
| 155 | 156 | =2.9543883E-01,               | =3.0018260E-01, | =3.0484284E-01, | =3.0941805E-01, | DATA 144 |   |
| 156 | 157 | =3.1390679E-01,               | =3.1830757E-01, | =3.2261894E-01, | =3.2683954E-01, | DATA 145 |   |
| 157 | 158 | =3.3096792E-01,               | =3.3500275E-01, | =3.3894270E-01, | =3.4278649E-01, | DATA 146 |   |
| 158 | 159 | =3.4653292E-01,               | =3.5018071E-01, | =3.5372877E-01, | =3.5717598E-01, | DATA 147 |   |
| 159 |     | DATA (BCSUN (I), I=145, 180), |                 |                 |                 | DATA 148 | 6 |
| 160 | 161 | =3.6052122E-01,               | =3.6376340E-01, | =3.6690144E-01, | =3.6993422E-01, | DATA 149 |   |
| 161 | 162 | =3.7286070E-01,               | =3.7567988E-01, | =3.7839065E-01, | =3.8099211E-01, | DATA 150 |   |
| 162 | 163 | =3.8348331E-01,               | =3.8586337E-01, | =3.8813148E-01, | =3.9028477E-01, | DATA 151 |   |
| 163 | 164 | =3.9232847E-01,               | =3.9425584E-01, | =3.9606816E-01, | =3.9776476E-01, | DATA 152 |   |
| 164 | 165 | =3.9934498E-01,               | =4.0080826E-01, | =4.0215399E-01, | =4.0338175E-01, | DATA 153 |   |
| 165 | 166 | =4.0449098E-01,               | =4.0548135E-01, | =4.0635242E-01, | =4.0710392E-01, | DATA 154 |   |
| 166 | 167 | =4.0773559E-01,               | =4.0824725E-01, | =4.0863882E-01, | =4.0891016E-01, | DATA 155 |   |
| 167 | 168 | =4.0906129E-01,               | =4.0909213E-01, | =4.0900279E-01, | =4.0879326E-01, | DATA 156 |   |
| 168 | 169 | =4.0846366E-01,               | =4.0801410E-01, | =4.0744450E-01, | =4.0675599E-01, | DATA 157 |   |
| 169 |     | DATA (BCSUN (I), I=181, 216), |                 |                 |                 | DATA 158 | 6 |
| 170 | 171 | =4.0394804E-01,               | =4.0302731E-01, | =4.0337626E-01, | =4.0281335E-01, | DATA 159 |   |
| 171 | 172 | =4.0153316E-01,               | =4.0013620E-01, | =3.9862309E-01, | =3.9699444E-01, | DATA 160 |   |
| 172 | 173 | =3.9525100E-01,               | =3.9339341E-01, | =3.9142244E-01, | =3.8933894E-01, | DATA 161 |   |
| 173 | 174 | =3.8714365E-01,               | =3.8483749E-01, | =3.8242127E-01, | =3.7989600E-01, | DATA 162 |   |
| 174 | 175 | =3.7726257E-01,               | =3.7452208E-01, | =3.7167551E-01, | =3.6872394E-01, | DATA 163 |   |
| 175 | 176 | =3.6566845E-01,               | =3.6251010E-01, | =3.5925000E-01, | =3.5588927E-01, | DATA 164 |   |
| 176 | 177 | =3.5242895E-01,               | =3.4887018E-01, | =3.4521420E-01, | =3.4146216E-01, | DATA 165 |   |
| 177 | 178 | =3.3761543E-01,               | =3.3367530E-01, | =3.2964300E-01, | =3.2552020E-01, | DATA 166 |   |
| 178 | 179 | =3.2130802E-01,               | =3.1700812E-01, | =3.1262176E-01, | =3.0815041E-01, | DATA 167 |   |
| 179 |     | DATA (BCSUN (I), I=217, 252), |                 |                 |                 | DATA 168 | 6 |
| 180 | 181 | =3.0359557E-01,               | =2.9895867E-01, | =2.9424217E-01, | =2.8944461E-01, | DATA 169 |   |



|     |                                |                 |                 |                 |                 |          |
|-----|--------------------------------|-----------------|-----------------|-----------------|-----------------|----------|
| 181 | 182                            | 2.8457046E=01,  | 2.7962017E=01,  | 2.7459527E=01,  | 2.6949727E=01,  | DATA 170 |
| 182 | 183                            | 2.6432767E=01,  | 2.5908801E=01,  | 2.5377981E=01,  | 2.4840456E=01,  | DATA 171 |
| 183 | 184                            | 2.4296376E=01,  | 2.3745893E=01,  | 2.3189152E=01,  | 2.2626293E=01,  | DATA 172 |
| 184 | 185                            | 2.2057454E=01,  | 2.1482771E=01,  | 2.0902397E=01,  | 2.0316476E=01,  | DATA 173 |
| 185 | 186                            | 1.9725157E=01,  | 1.9128593E=01,  | 1.8526940E=01,  | 1.7920358E=01,  | DATA 174 |
| 186 | 187                            | 1.7309006E=01,  | 1.6693044E=01,  | 1.6072633E=01,  | 1.5447933E=01,  | DATA 175 |
| 187 | 188                            | 1.4819107E=01,  | 1.4186313E=01,  | 1.3549716E=01,  | 1.2909478E=01,  | DATA 176 |
| 188 | 189                            | 1.2265762E=01,  | 1.1618729E=01,  | 1.0968540E=01,  | 1.0315359E=01,  | DATA 177 |
| 189 | DATA (BCSUN (I), I=253, 288) / |                 |                 |                 |                 | DATA 178 |
| 190 | 191                            | 9.6593494E=02,  | 9.0006777E=02,  | 8.3395028E=02,  | 7.6759866E=02,  | DATA 179 |
| 191 | 192                            | 7.0102897E=02,  | 6.3425767E=02,  | 5.6729943E=02,  | 5.0016927E=02,  | DATA 180 |
| 192 | 193                            | 4.3288196E=02,  | 3.6545199E=02,  | 2.9789467E=02,  | 2.3022513E=02,  | DATA 181 |
| 193 | 194                            | 1.6245880E=02,  | 9.4610988E=03,  | 2.0698378E=03,  | 4.1262565E=03,  | DATA 182 |
| 194 | 195                            | =1.0925516E=02, | =1.7726261E=02, | =2.4526794E=02, | =3.1325399E=02, | DATA 183 |
| 195 | 196                            | =3.8120353E=02, | =4.4909944E=02, | =5.1692390E=02, | =5.8465935E=02, | DATA 184 |
| 196 | 197                            | =6.5228802E=02, | =7.1979242E=02, | =7.8715439E=02, | =8.5435587E=02, | DATA 185 |
| 197 | 198                            | =9.2137855E=02, | =9.8820382E=02, | =1.0548136E=01, | =1.1211893E=01, | DATA 186 |
| 198 | 199                            | =1.1873131E=01, | =1.2331657E=01, | =1.3187302E=01, | =1.3839891E=01, | DATA 187 |
| 199 | DATA (BCSUN (I), I=289, 324) / |                 |                 |                 |                 | DATA 188 |
| 200 | 201                            | =1.4489252E=01, | =1.5135211E=01, | =1.5777597E=01, | =1.6416234E=01, | DATA 189 |
| 201 | 202                            | =1.7050945E=01, | =1.7681557E=01, | =1.8307675E=01, | =1.8929720E=01, | DATA 190 |
| 202 | 203                            | =1.9546897E=01, | =2.0159220E=01, | =2.0766493E=01, | =2.1368521E=01, | DATA 191 |
| 203 | 204                            | =2.1965112E=01, | =2.256072E=01,  | =2.3141175E=01, | =2.3720286E=01, | DATA 192 |
| 204 | 205                            | =2.4293147E=01, | =2.4859582E=01, | =2.5419384E=01, | =2.5972352E=01, | DATA 193 |
| 205 | 206                            | =2.6518281E=01, | =2.7056965E=01, | =2.7588201E=01, | =2.8111783E=01, | DATA 194 |
| 206 | 207                            | =2.8627509E=01, | =2.9135172E=01, | =2.9634535E=01, | =3.0125555E=01, | DATA 195 |
| 207 | 208                            | =3.0607894E=01, | =3.1081415E=01, | =3.1545936E=01, | =3.2001277E=01, | DATA 196 |
| 208 | 209                            | =3.2447251E=01, | =3.2883684E=01, | =3.3310398E=01, | =3.3727187E=01, | DATA 197 |
| 209 | DATA (BCSUN (I), I=325, 360) / |                 |                 |                 |                 | DATA 198 |
| 210 | 211                            | =3.4133898E=01, | =3.4530342E=01, | =3.4916343E=01, | =3.5291724E=01, | DATA 199 |
| 211 | 212                            | =3.5656316E=01, | =3.6009947E=01, | =3.6352430E=01, | =3.6683662E=01, | DATA 200 |
| 212 | 213                            | =3.7003426E=01, | =3.7311587E=01, | =3.7607995E=01, | =3.7892501E=01, | DATA 201 |
| 213 | 214                            | =3.8164957E=01, | =3.8425226E=01, | =3.8673164E=01, | =3.8908640E=01, | DATA 202 |
| 214 | 215                            | =3.9131523E=01, | =3.9341690E=01, | =3.9539029E=01, | =3.9723438E=01, | DATA 203 |
| 215 | 216                            | =3.9894815E=01, | =4.0053076E=01, | =4.0198134E=01, | =4.0329918E=01, | DATA 204 |
| 216 | 217                            | =4.0448353E=01, | =4.0553379E=01, | =4.0644935E=01, | =4.0722969E=01, | DATA 205 |
| 217 | 218                            | =4.0787432E=01, | =4.0838291E=01, | =4.0875501E=01, | =4.0899047E=01, | DATA 206 |
| 218 | 219                            | =4.0908902E=01, | =4.0905056E=01, | =4.0887503E=01, | =4.0856252E=01, | DATA 207 |
| 219 | DATA (BCSUN (I), I=361, 368) / |                 |                 |                 |                 | DATA 208 |
| 220 | 221                            | =4.0811310E=01, | =4.0752703E=01, | =4.0680458E=01, | =4.0594615E=01, | DATA 209 |
| 221 | 222                            | =4.0495216E=01, | =4.0382315E=01, | =4.0255958E=01, | =4.0116213E=01, | DATA 210 |
| 222 | DATA (RSUN (I), I=1, 36) /     |                 |                 |                 |                 | DATA 210 |
| 223 | 231                            | 9.8397228E=01,  | 9.8396422E=01,  | 9.8396168E=01,  | 9.8396435E=01,  | DATA 211 |
| 224 | 232                            | 9.8397195E=01,  | 9.8398425E=01,  | 9.8400089E=01,  | 9.8402158E=01,  | DATA 212 |
| 225 | 233                            | 9.8404606E=01,  | 9.8407387E=01,  | 9.8410527E=01,  | 9.8414032E=01,  | DATA 213 |
| 226 | 234                            | 9.8417910E=01,  | 9.8422169E=01,  | 9.8426839E=01,  | 9.8431948E=01,  | DATA 214 |
| 227 | 235                            | 9.8437522E=01,  | 9.8443603E=01,  | 9.8450199E=01,  | 9.8457333E=01,  | DATA 215 |
| 228 | 236                            | 9.8465022E=01,  | 9.8473287E=01,  | 9.8482134E=01,  | 9.8491576E=01,  | DATA 216 |
| 229 | 237                            | 9.8501614E=01,  | 9.8512256E=01,  | 9.8523495E=01,  | 9.8535321E=01,  | DATA 217 |
| 230 | 238                            | 9.8547724E=01,  | 9.8560698E=01,  | 9.8574208E=01,  | 9.8588227E=01,  | DATA 218 |
| 231 | 239                            | 9.8602720E=01,  | 9.8617666E=01,  | 9.8633018E=01,  | 9.8648738E=01,  | DATA 219 |
| 232 | DATA (RSUN (I), I=37, 72) /    |                 |                 |                 |                 | DATA 220 |
| 233 | 241                            | 9.8664792E=01,  | 9.8681127E=01,  | 9.8697745E=01,  | 9.8714635E=01,  | DATA 221 |
| 234 | 242                            | 9.8731788E=01,  | 9.8749187E=01,  | 9.8766859E=01,  | 9.8784821E=01,  | DATA 222 |
| 235 | 243                            | 9.8803092E=01,  | 9.8821699E=01,  | 9.8840656E=01,  | 9.8859978E=01,  | DATA 223 |
| 236 | 244                            | 9.8879688E=01,  | 9.8899803E=01,  | 9.8920333E=01,  | 9.8941292E=01,  | DATA 224 |
| 237 | 245                            | 9.8962688E=01,  | 9.8984531E=01,  | 9.9006818E=01,  | 9.9029548E=01,  | DATA 225 |
| 238 | 246                            | 9.9052714E=01,  | 9.9076318E=01,  | 9.9100325E=01,  | 9.9124706E=01,  | DATA 226 |
| 239 | 247                            | 9.9149435E=01,  | 9.9174487E=01,  | 9.9199814E=01,  | 9.9225371E=01,  | DATA 227 |
| 240 | 248                            | 9.9251119E=01,  | 9.9277008E=01,  | 9.9303019E=01,  | 9.9329128E=01,  | DATA 228 |
| 241 | 249                            | 9.9355313E=01,  | 9.9381540E=01,  | 9.9407827E=01,  | 9.9434178E=01,  | DATA 229 |
| 242 | DATA (RSUN (I), I=73, 108) /   |                 |                 |                 |                 | DATA 230 |
| 243 | 251                            | 9.9460602E=01,  | 9.9487112E=01,  | 9.9513720E=01,  | 9.9540442E=01,  | DATA 231 |
| 244 | 252                            | 9.9567293E=01,  | 9.9594291E=01,  | 9.9621451E=01,  | 9.9648787E=01,  | DATA 232 |
| 245 | 253                            | 9.9676314E=01,  | 9.9704041E=01,  | 9.9731977E=01,  | 9.9760128E=01,  | DATA 233 |
| 246 | 254                            | 9.9788494E=01,  | 9.9817088E=01,  | 9.9845878E=01,  | 9.9874847E=01,  | DATA 234 |
| 247 | 255                            | 9.9903966E=01,  | 9.9933223E=01,  | 9.9962565E=01,  | 9.9991947E=01,  | DATA 235 |
| 248 | 256                            | 1.0002133E 00,  | 1.0005067E 00,  | 1.0007993E 00,  | 1.0010908E 00,  | DATA 236 |
| 249 | 257                            | 1.0013809E 00,  | 1.0016692E 00,  | 1.0019558E 00,  | 1.0022405E 00,  | DATA 237 |
| 250 | 258                            | 1.0025235E 00,  | 1.0028047E 00,  | 1.0030841E 00,  | 1.0033619E 00,  | DATA 238 |
| 251 | 259                            | 1.0036383E 00,  | 1.0039133E 00,  | 1.0041872E 00,  | 1.0044600E 00,  | DATA 239 |
| 252 | DATA (RSUN (I), I=109, 144) /  |                 |                 |                 |                 | DATA 240 |
| 253 | 261                            | 1.0047320E 00,  | 1.0050033E 00,  | 1.0052740E 00,  | 1.0055444E 00,  | DATA 241 |

|     |     |                               |                |                |                |          |
|-----|-----|-------------------------------|----------------|----------------|----------------|----------|
| 254 | 262 | 1.0058145E 00,                | 1.0060843E 00, | 1.0063542E 00, | 1.0066237E 00, | DATA 242 |
| 255 | 263 | 1.0068926E 00,                | 1.0071610E 00, | 1.0074283E 00, | 1.0076943E 00, | DATA 243 |
| 256 | 264 | 1.0079384E 00,                | 1.0082202E 00, | 1.0084794E 00, | 1.0087356E 00, | DATA 244 |
| 257 | 265 | 1.0089886E 00,                | 1.0092379E 00, | 1.0094834E 00, | 1.0097250E 00, | DATA 245 |
| 258 | 266 | 1.0099627E 00,                | 1.0101963E 00, | 1.0104238E 00, | 1.0106514E 00, | DATA 246 |
| 259 | 267 | 1.0108732E 00,                | 1.0110912E 00, | 1.0113036E 00, | 1.0115163E 00, | DATA 247 |
| 260 | 268 | 1.0117242E 00,                | 1.0119288E 00, | 1.0121303E 00, | 1.0123293E 00, | DATA 248 |
| 261 | 269 | 1.0125262E 00,                | 1.0127207E 00, | 1.0129130E 00, | 1.0131031E 00, | DATA 249 |
| 262 |     | DATA (RSUN (I), I=143, 180, / |                |                |                | DATA 250 |
| 263 | 271 | 1.0132911E 00,                | 1.0134772E 00, | 1.0136607E 00, | 1.0138415E 00, | DATA 251 |
| 264 | 272 | 1.0140192E 00,                | 1.0141933E 00, | 1.0143636E 00, | 1.0145297E 00, | DATA 252 |
| 265 | 273 | 1.0146913E 00,                | 1.0148479E 00, | 1.0149993E 00, | 1.0151458E 00, | DATA 253 |
| 266 | 274 | 1.0152868E 00,                | 1.0154223E 00, | 1.0155523E 00, | 1.0156767E 00, | DATA 254 |
| 267 | 275 | 1.0157958E 00,                | 1.0159094E 00, | 1.0160179E 00, | 1.0161212E 00, | DATA 255 |
| 268 | 276 | 1.0162196E 00,                | 1.0163132E 00, | 1.0164023E 00, | 1.0164873E 00, | DATA 256 |
| 269 | 277 | 1.0165684E 00,                | 1.0166457E 00, | 1.0167197E 00, | 1.0167903E 00, | DATA 257 |
| 270 | 278 | 1.0168578E 00,                | 1.0169225E 00, | 1.0169841E 00, | 1.0170422E 00, | DATA 258 |
| 271 | 279 | 1.0170967E 00,                | 1.0171474E 00, | 1.0171938E 00, | 1.0172358E 00, | DATA 259 |
| 272 |     | DATA (RSUN (I), I=181, 216, / |                |                |                | DATA 260 |
| 273 | 281 | 1.0172728E 00,                | 1.0173046E 00, | 1.0173310E 00, | 1.0173518E 00, | DATA 261 |
| 274 | 282 | 1.0173668E 00,                | 1.0173759E 00, | 1.0173790E 00, | 1.0173761E 00, | DATA 262 |
| 275 | 283 | 1.0173673E 00,                | 1.0173524E 00, | 1.0173317E 00, | 1.0173053E 00, | DATA 263 |
| 276 | 284 | 1.0172733E 00,                | 1.0172358E 00, | 1.0171933E 00, | 1.0171459E 00, | DATA 264 |
| 277 | 285 | 1.0170940E 00,                | 1.0170378E 00, | 1.0169777E 00, | 1.0169140E 00, | DATA 265 |
| 278 | 286 | 1.0168470E 00,                | 1.0167771E 00, | 1.0167042E 00, | 1.0166281E 00, | DATA 266 |
| 279 | 287 | 1.0165487E 00,                | 1.0164661E 00, | 1.0163798E 00, | 1.0162897E 00, | DATA 267 |
| 280 | 288 | 1.0161954E 00,                | 1.0160964E 00, | 1.0159929E 00, | 1.0158843E 00, | DATA 268 |
| 281 | 289 | 1.0157707E 00,                | 1.0156519E 00, | 1.0155277E 00, | 1.0153980E 00, | DATA 269 |
| 282 |     | DATA (RSUN (I), I=217, 252, / |                |                |                | DATA 270 |
| 283 | 291 | 1.0152630E 00,                | 1.0151224E 00, | 1.0149765E 00, | 1.0148253E 00, | DATA 271 |
| 284 | 292 | 1.0146689E 00,                | 1.0145074E 00, | 1.0143412E 00, | 1.0141705E 00, | DATA 272 |
| 285 | 293 | 1.0139957E 00,                | 1.0138170E 00, | 1.0136348E 00, | 1.0134496E 00, | DATA 273 |
| 286 | 294 | 1.0132618E 00,                | 1.0130717E 00, | 1.0128794E 00, | 1.0126851E 00, | DATA 274 |
| 287 | 295 | 1.0124886E 00,                | 1.0122904E 00, | 1.0120899E 00, | 1.0118871E 00, | DATA 275 |
| 288 | 296 | 1.0116818E 00,                | 1.0114733E 00, | 1.0112622E 00, | 1.0110476E 00, | DATA 276 |
| 289 | 297 | 1.0108297E 00,                | 1.0106082E 00, | 1.0103830E 00, | 1.0101539E 00, | DATA 277 |
| 290 | 298 | 1.0099210E 00,                | 1.0096841E 00, | 1.0094433E 00, | 1.0091986E 00, | DATA 278 |
| 291 | 299 | 1.0089502E 00,                | 1.0086979E 00, | 1.0084423E 00, | 1.0081834E 00, | DATA 279 |
| 292 |     | DATA (RSUN (I), I=253, 288, / |                |                |                | DATA 280 |
| 293 | 301 | 1.0079218E 00,                | 1.0076574E 00, | 1.0073909E 00, | 1.0071227E 00, | DATA 281 |
| 294 | 302 | 1.0068531E 00,                | 1.0065828E 00, | 1.0063113E 00, | 1.0060404E 00, | DATA 282 |
| 295 | 303 | 1.0057687E 00,                | 1.0054973E 00, | 1.0052257E 00, | 1.0049539E 00, | DATA 283 |
| 296 | 304 | 1.0046818E 00,                | 1.0044093E 00, | 1.0041361E 00, | 1.0038622E 00, | DATA 284 |
| 297 | 305 | 1.0035873E 00,                | 1.0033112E 00, | 1.0030339E 00, | 1.0027552E 00, | DATA 285 |
| 298 | 306 | 1.0024749E 00,                | 1.0021929E 00, | 1.0019094E 00, | 1.0016241E 00, | DATA 286 |
| 299 | 307 | 1.0013371E 00,                | 1.0010484E 00, | 1.0007582E 00, | 1.0004667E 00, | DATA 287 |
| 300 | 308 | 1.0001743E 00,                | 9.9988106E-01, | 9.9958749E-01, | 9.9929404E-01, | DATA 288 |
| 301 | 309 | 9.9900112E-01,                | 9.9870222E-01, | 9.9841861E-01, | 9.9812961E-01, | DATA 289 |
| 302 |     | DATA (RSUN (I), I=289, 324, / |                |                |                | DATA 290 |
| 303 | 311 | 9.9784253E-01,                | 9.9755777E-01, | 9.9727525E-01, | 9.9699497E-01, | DATA 291 |
| 304 | 312 | 9.9671695E-01,                | 9.9644115E-01, | 9.9616744E-01, | 9.9589570E-01, | DATA 292 |
| 305 | 313 | 9.9562576E-01,                | 9.9535748E-01, | 9.9509069E-01, | 9.9482525E-01, | DATA 293 |
| 306 | 314 | 9.9456099E-01,                | 9.9429781E-01, | 9.9403556E-01, | 9.9377412E-01, | DATA 294 |
| 307 | 315 | 9.9351341E-01,                | 9.9325327E-01, | 9.9299388E-01, | 9.9273541E-01, | DATA 295 |
| 308 | 316 | 9.9247799E-01,                | 9.9222166E-01, | 9.9196696E-01, | 9.9171425E-01, | DATA 296 |
| 309 | 317 | 9.9146394E-01,                | 9.9121647E-01, | 9.9097219E-01, | 9.9073144E-01, | DATA 297 |
| 310 | 318 | 9.9049454E-01,                | 9.9026196E-01, | 9.9003370E-01, | 9.8980987E-01, | DATA 298 |
| 311 | 319 | 9.8959057E-01,                | 9.8937587E-01, | 9.8916568E-01, | 9.8895993E-01, | DATA 299 |
| 312 |     | DATA (RSUN (I), I=325, 360, / |                |                |                | DATA 300 |
| 313 | 321 | 9.8875850E-01,                | 9.8856127E-01, | 9.8836806E-01, | 9.8817875E-01, | DATA 301 |
| 314 | 322 | 9.8799314E-01,                | 9.8781113E-01, | 9.8763243E-01, | 9.8745687E-01, | DATA 302 |
| 315 | 323 | 9.8728425E-01,                | 9.8711436E-01, | 9.8694722E-01, | 9.8678283E-01, | DATA 303 |
| 316 | 324 | 9.8662119E-01,                | 9.8646216E-01, | 9.8630623E-01, | 9.8615371E-01, | DATA 304 |
| 317 | 325 | 9.8600493E-01,                | 9.8586026E-01, | 9.8572004E-01, | 9.8558462E-01, | DATA 305 |
| 318 | 326 | 9.8645433E-01,                | 9.8632962E-01, | 9.8621055E-01, | 9.8609732E-01, | DATA 306 |
| 319 | 327 | 9.8499003E-01,                | 9.8488884E-01, | 9.8479371E-01, | 9.8470457E-01, | DATA 307 |
| 320 | 328 | 9.8462139E-01,                | 9.8454409E-01, | 9.8447210E-01, | 9.8440647E-01, | DATA 308 |
| 321 | 329 | 9.8434582E-01,                | 9.8429039E-01, | 9.8423991E-01, | 9.8419408E-01, | DATA 309 |
| 322 |     | DATA (RSUN (I), I=361, 368, / |                |                |                | DATA 310 |
| 323 | 331 | 9.8415266E-01,                | 9.8411539E-01, | 9.8408207E-01, | 9.8405252E-01, | DATA 311 |
| 324 | 332 | 9.8402662E-01,                | 9.8400398E-01, | 9.8398503E-01, | 9.8396991E-01, | DATA 312 |
| 325 |     | DATA (RAMOON(I), I= 1, 36, /  |                |                |                | DATA 312 |
| 326 | 341 | 2.7970054E 00,                | 3.0065657E 00, | 3.2203079E 00, | 3.4413728E 00, | DATA 313 |



|     |     |                                |                 |                 |                 |          |
|-----|-----|--------------------------------|-----------------|-----------------|-----------------|----------|
| 827 | 342 | 3.6728890E 00,                 | 3.9173602E 00,  | 4.17272537E 00, | 4.2464878E 00,  | DATA 314 |
| 828 | 343 | 4.7249419E 00,                 | 5.0042507E 00,  | 5.2773784E 00,  | 5.5392865E 00,  | DATA 315 |
| 829 | 344 | 5.7079149E 00,                 | 6.0230238E 00,  | 6.2492165E 00,  | 6.5300985E 01,  | DATA 316 |
| 830 | 345 | 3.9695330E -01,                | 6.0010705E -01, | 6.1238807E -01, | 6.3820779E 00,  | DATA 317 |
| 831 | 346 | 1.2468361E 00,                 | 1.4634126E 00,  | 1.6800478E 00,  | 1.8902339E 00,  | DATA 318 |
| 832 | 347 | 2.1141299E 00,                 | 2.3278736E 00,  | 2.5393972E 00,  | 2.8494030E 00,  | DATA 319 |
| 833 | 348 | 2.9593512E 00,                 | 3.1713207E 00,  | 3.3828441E 00,  | 3.6116327E 00,  | DATA 320 |
| 834 | 349 | 3.8451785E 00,                 | 4.0901636E 00,  | 4.3467143E 00,  | 4.6127600E 00,  | DATA 321 |
| 835 |     | DATA (RAMOON1), 1# 371, 721/   |                 |                 |                 | DATA 322 |
| 836 | 351 | 4.8839913E 00,                 | 5.1947883E 00,  | 5.4196423E 00,  | 5.6758810E 00,  | DATA 323 |
| 837 | 352 | 5.9206859E 00,                 | 6.1557481E 00,  | 6.3956494E 02,  | 6.6019216E 01,  | DATA 324 |
| 838 | 353 | 5.7222160E -01,                | 7.5252676E -01, | 9.6793429E -01, | 1.1831189E 00,  | DATA 325 |
| 839 | 354 | 1.3995494E 00,                 | 1.6163691E 00,  | 1.8338752E 00,  | 2.0498719E 00,  | DATA 326 |
| 840 | 355 | 2.2049443E 00,                 | 2.4736867E 00,  | 2.6912383E 00,  | 2.9048162E 00,  | DATA 327 |
| 841 | 356 | 3.1191518E 00,                 | 3.3373515E 00,  | 3.5611747E 00,  | 3.7925134E 00,  | DATA 328 |
| 842 | 357 | 4.0326588E 00,                 | 4.2617954E 00,  | 4.5388853E 00,  | 4.8001168E 00,  | DATA 329 |
| 843 | 358 | 5.0624332E 00,                 | 5.3215379E 00,  | 5.5744063E 00,  | 5.8195349E 00,  | DATA 330 |
| 844 | 359 | 6.0868983E 00,                 | 6.3424618E 03,  | 6.5900669E -01, | 6.8177113E -01, | DATA 331 |
| 845 |     | DATA (RAMOON1), 1# 731, 1081/  |                 |                 |                 | DATA 332 |
| 846 | 361 | 6.7168888E -01,                | 8.9061733E -01, | 1.1091429E 00,  | 1.3274022E 00,  | DATA 333 |
| 847 | 362 | 1.5651889E 00,                 | 1.7621278E 00,  | 1.9778808E 00,  | 2.1923402E 00,  | DATA 334 |
| 848 | 363 | 2.4057727E 00,                 | 2.6188942E 00,  | 2.8328710E 00,  | 3.0492544E 00,  | DATA 335 |
| 849 | 364 | 3.2698447E 00,                 | 3.4964508E 00,  | 3.7306667E 00,  | 3.9732453E 00,  | DATA 336 |
| 850 | 365 | 4.2238478E 00,                 | 4.4806591E 00,  | 4.7405339E 00,  | 4.9998830E 00,  | DATA 337 |
| 851 | 366 | 5.2545936E 00,                 | 5.5029118E 00,  | 5.7437568E 00,  | 5.9773660E 00,  | DATA 338 |
| 852 | 367 | 6.2056558E 00,                 | 6.4654726E -01, | 6.6829233E -01, | 6.8905900E -01, | DATA 339 |
| 853 | 368 | 8.0968262E -01,                | 1.0304083E 00,  | 1.2509494E 00,  | 1.4706440E 00,  | DATA 340 |
| 854 | 369 | 1.6887558E 00,                 | 1.9047154E 00,  | 2.1183705E 00,  | 2.3301160E 00,  | DATA 341 |
| 855 |     | DATA (RAMOON1), 1# 1091, 1441/ |                 |                 |                 | DATA 342 |
| 856 | 371 | 2.5409284E 00,                 | 2.7523217E 00,  | 2.9662473E 00,  | 3.1847398E 00,  | DATA 343 |
| 857 | 372 | 3.4106841E 00,                 | 3.6454549E 00,  | 3.8903978E 00,  | 4.1452163E 00,  | DATA 344 |
| 858 | 373 | 4.4077133E 00,                 | 4.6739819E 00,  | 4.9387830E 00,  | 5.1979166E 00,  | DATA 345 |
| 859 | 374 | 5.4483739E 00,                 | 5.6892442E 00,  | 5.9213185E 00,  | 6.1464626E 00,  | DATA 346 |
| 860 | 375 | 6.3807751E -02,                | 3.0199999E -01, | 3.1973639E -01, | 7.3826829E -01, | DATA 347 |
| 861 | 376 | 9.5805252E -01,                | 1.1787943E 00,  | 1.3995544E 00,  | 1.6190865E 00,  | DATA 348 |
| 862 | 377 | 1.8362283E 00,                 | 2.0502665E 00,  | 2.2611779E 00,  | 2.4697140E 00,  | DATA 349 |
| 863 | 378 | 2.6773618E 00,                 | 2.8862322E 00,  | 3.0989094E 00,  | 3.3182483E 00,  | DATA 350 |
| 864 | 379 | 3.5470666E 00,                 | 3.7876285E 00,  | 4.0409172E 00,  | 4.3057662E 00,  | DATA 351 |
| 865 |     | DATA (RAMOON1), 1# 1451, 1801/ |                 |                 |                 | DATA 352 |
| 866 | 381 | 4.5783913E 00,                 | 4.8529044E 00,  | 5.1229479E 00,  | 5.3836206E 00,  | DATA 353 |
| 867 | 382 | 5.6325809E 00,                 | 5.8699746E 00,  | 6.0976617E 00,  | 6.3155655E -02, | DATA 354 |
| 868 | 383 | 2.5168565E -01,                | 4.6662952E -01, | 6.8195082E -01, | 8.9880854E -01, | DATA 355 |
| 869 | 384 | 1.1174525E 00,                 | 1.3372632E 00,  | 1.5569799E 00,  | 1.7750915E 00,  | DATA 356 |
| 870 | 385 | 1.9902985E 00,                 | 2.2019010E 00,  | 2.4100203E 00,  | 2.6156449E 00,  | DATA 357 |
| 871 | 386 | 2.8205537E 00,                 | 3.0271804E 00,  | 3.2384491E 00,  | 3.4572562E 00,  | DATA 358 |
| 872 | 387 | 3.6876186E 00,                 | 3.9310746E 00,  | 4.1887870E 00,  | 4.4590533E 00,  | DATA 359 |
| 873 | 388 | 4.7371587E 00,                 | 5.0162154E 00,  | 5.2892544E 00,  | 5.5513659E 00,  | DATA 360 |
| 874 | 389 | 5.8506341E 00,                 | 6.0377449E 00,  | 6.2649884E 00,  | 6.4812656E -01, | DATA 361 |
| 875 |     | DATA (RAMOON1), 1# 1811, 2161/ |                 |                 |                 | DATA 362 |
| 876 | 391 | 4.1846963E -01,                | 6.3334665E -01, | 8.4859412E -01, | 1.0651870E 00,  | DATA 363 |
| 877 | 392 | 1.2832023E 00,                 | 1.5019026E 00,  | 1.7200073E 00,  | 1.9361005E 00,  | DATA 364 |
| 878 | 393 | 2.1490654E 00,                 | 2.3584241E 00,  | 2.5645097E 00,  | 2.7684807E 00,  | DATA 365 |
| 879 | 394 | 2.9722344E 00,                 | 3.1782726E 00,  | 3.3895370E 00,  | 3.6091788E 00,  | DATA 366 |
| 880 | 395 | 3.8401798E 00,                 | 4.0847234E 00,  | 4.3433011E 00,  | 4.6138238E 00,  | DATA 367 |
| 881 | 396 | 4.8913808E 00,                 | 5.1692654E 00,  | 5.4410277E 00,  | 5.7025497E 00,  | DATA 368 |
| 882 | 397 | 5.951747E 00,                  | 6.1899199E 00,  | 6.4394082E -01, | 6.6881072E -01, | DATA 369 |
| 883 | 398 | 5.7791526E -01,                | 7.9536866E -01, | 1.0126138E 00,  | 1.2303197E 00,  | DATA 370 |
| 884 | 399 | 1.4483950E 00,                 | 1.6661378E 00,  | 1.8825163E 00,  | 2.0965220E 00,  | DATA 371 |
| 885 |     | DATA (RAMOON1), 1# 2171, 2521/ |                 |                 |                 | DATA 372 |
| 886 | 401 | 2.3075052E 00,                 | 2.5154088E 00,  | 2.7208889E 00,  | 2.9252012E 00,  | DATA 373 |
| 887 | 402 | 3.1303161E 00,                 | 3.3385897E 00,  | 3.5526906E 00,  | 3.7753224E 00,  | DATA 374 |
| 888 | 403 | 4.0688162E 00,                 | 4.2545303E 00,  | 4.4512132E 00,  | 4.7790814E 00,  | DATA 375 |
| 889 | 404 | 5.0507910E 00,                 | 5.3217334E 00,  | 5.5870355E 00,  | 5.8436862E 00,  | DATA 376 |
| 890 | 405 | 6.0908161E 00,                 | 6.4039676E -02, | 6.745556E -01,  | 7.0388029E -01, | DATA 377 |
| 891 | 406 | 7.2713380E -01,                | 9.4858350E -01, | 1.1690174E 00,  | 1.3886379E 00,  | DATA 378 |
| 892 | 407 | 1.6071663E 00,                 | 1.8240411E 00,  | 2.0386593E 00,  | 2.2506736E 00,  | DATA 379 |
| 893 | 408 | 2.4600822E 00,                 | 2.6674298E 00,  | 2.8737737E 00,  | 3.0806434E 00,  | DATA 380 |
| 894 | 409 | 3.2899434E 00,                 | 3.5038080E 00,  | 3.7243915E 00,  | 3.9535604E 00,  | DATA 381 |
| 895 |     | DATA (RAMOON1), 1# 2531, 2891/ |                 |                 |                 | DATA 382 |
| 896 | 411 | 4.1924725E 00,                 | 4.4410977E 00,  | 4.6978631E 00,  | 4.9596947E 00,  | DATA 383 |
| 897 | 412 | 5.2226363E 00,                 | 5.4828719E 00,  | 5.7376647E 00,  | 5.9857832E 00,  | DATA 384 |
| 898 | 413 | 6.2273579E 00,                 | 6.5021711E -01, | 6.7208940E -01, | 6.9105378E -01, | DATA 385 |
| 899 | 414 | 8.6799932E -01,                | 1.0933174E 00,  | 1.3169255E 00,  | 1.5384103E 00,  | DATA 386 |

|     |                                       |                 |                 |                 |                 |          |
|-----|---------------------------------------|-----------------|-----------------|-----------------|-----------------|----------|
| 600 | 415                                   | 1.7872468E 00,  | 1.9730323E 00,  | 2.1856790E 00,  | 3.3955310E 00,  | DATA 387 |
| 601 | 416                                   | 2.6034015E 00,  | 2.8103448E 00,  | 3.0185846E 00,  | 3.2294065E 00,  | DATA 388 |
| 602 | 417                                   | 3.4450079E 00,  | 3.6672821E 00,  | 3.8977124E 00,  | 4.1369558E 00,  | DATA 389 |
| 603 | 418                                   | 4.3044082E 00,  | 4.6387084E 00,  | 4.8962461E 00,  | 5.1536858E 00,  | DATA 390 |
| 604 | 419                                   | 5.4078978E 00,  | 5.6568763E 00,  | 5.8999814E 00,  | 6.1377718E 00,  | DATA 391 |
| 605 | DATA (RAMOON(1),1#289,324,/) DATA 392 |                 |                 |                 |                 | 6        |
| 606 | 421                                   | 8.8297947E-02,  | 3.1941133E-01,  | 5.4919.21E-01,  | 7.7838247E-01,  | DATA 393 |
| 607 | 422                                   | 1.0070616E 00,  | 1.2346670E 00,  | 1.4602087E 00,  | 1.6826006E 00,  | DATA 394 |
| 608 | 423                                   | 1.9010115E 00,  | 2.1151318E 00,  | 2.3253019E 00,  | 2.5325111E 00,  | DATA 395 |
| 609 | 424                                   | 2.7383124E 00,  | 2.9446990E 00,  | 3.1539624E 00,  | 3.3685187E 00,  | DATA 396 |
| 610 | 425                                   | 3.5906659E 00,  | 3.8222227E 00,  | 4.0640374E 00,  | 4.3154659E 00,  | DATA 397 |
| 611 | 426                                   | 4.5740787E 00,  | 4.8359351E 00,  | 5.0965257E 00,  | 5.3520147E 00,  | DATA 398 |
| 612 | 427                                   | 5.6001548E 00,  | 5.8405170E 00,  | 6.0741387E 00,  | 1.9738795E-02,  | DATA 399 |
| 613 | 428                                   | 2.4886350E-01,  | 4.7126382E-01,  | 6.9736081E-01,  | 9.2460835E-01,  | DATA 400 |
| 614 | 429                                   | 1.1526068E 00,  | 1.3801370E 00,  | 1.6055395E 00,  | 1.8272073E 00,  | DATA 401 |
| 615 | DATA (RAMOON(1),1#325,360,/) DATA 402 |                 |                 |                 |                 | 6        |
| 616 | 431                                   | 2.0440483E 00,  | 2.2557761E 00,  | 2.4630020E 00,  | 2.6671365E 00,  | DATA 403 |
| 617 | 432                                   | 2.8702561E 00,  | 3.0749241E 00,  | 3.2840196E 00,  | 3.5005229E 00,  | DATA 404 |
| 618 | 433                                   | 3.7271853E 00,  | 3.9660005E 00,  | 4.2174709E 00,  | 4.4798829E 00,  | DATA 405 |
| 619 | 434                                   | 4.7490876E 00,  | 5.0192909E 00,  | 5.2847353E 00,  | 5.5413716E 00,  | DATA 406 |
| 620 | 435                                   | 5.7876225E 00,  | 6.0241243E 00,  | 6.2529467E 00,  | 1.9359660E-01,  | DATA 407 |
| 621 | 436                                   | 4.1812581E-01,  | 6.3656460E-01,  | 8.5933638E-01,  | 1.8838636E 00,  | DATA 408 |
| 622 | 437                                   | 1.3095361E 00,  | 1.5348867E 00,  | 1.7580378E 00,  | 1.9772419E 00,  | DATA 409 |
| 623 | 438                                   | 2.1913724E 00,  | 2.4002083E 00,  | 2.6044897E 00,  | 2.8058143E 00,  | DATA 410 |
| 624 | 439                                   | 3.0664702E 00,  | 3.2092666E 00,  | 3.4173627E 00,  | 3.6340462E 00,  | DATA 411 |
| 625 | DATA (RAMOON(1),1#361,368,/) DATA 412 |                 |                 |                 |                 | 6        |
| 626 | 441                                   | 3.8623649E 00,  | 4.1045041E 00,  | 4.3609005E 00,  | 4.6293716E 00,  | DATA 413 |
| 627 | 442                                   | 4.9649163E 00,  | 5.1807958E 00,  | 5.4506232E 00,  | 5.7162290E 00,  | DATA 414 |
| 628 | DATA (RAMOON(1),1# 1, 36,/) DATA 414  |                 |                 |                 |                 | 6        |
| 629 | 451                                   | 9.7026602E-02,  | 2.8543608E-02,  | 4.2814964E-02,  | 1.14088290E-01, | DATA 415 |
| 630 | 452                                   | -1.8166099E-01, | -2.4119184E-01, | -2.8769543E-01, | -3.2618492E-01, | DATA 416 |
| 631 | 453                                   | -3.2281137E-01, | -3.6614660E-01, | -4.2174709E-01, | -2.1217908E-01, | DATA 417 |
| 632 | 454                                   | -1.4478298E-01, | -7.1324022E-02, | 3.8041765E-03,  | 7.5234709E-02,  | DATA 418 |
| 633 | 455                                   | 1.4151885E-01,  | 1.9988262E-01,  | 2.4849428E-01,  | 2.8582840E-01,  | DATA 419 |
| 634 | 456                                   | 3.1060396E-01,  | 3.2186908E-01,  | 3.1908353E-01,  | 3.8225717E-01,  | DATA 420 |
| 635 | 457                                   | 2.7200812E-01,  | 2.2955449E-01,  | 1.7663399E-01,  | 1.1538990E-01,  | DATA 421 |
| 636 | 458                                   | 4.8270277E-02,  | -2.2023388E-02, | 9.2522166E-02,  | -1.5992193E-01, | DATA 422 |
| 637 | 459                                   | -2.2051067E-01, | -2.7018697E-01, | -3.0470814E-01, | -3.2028428E-01, | DATA 423 |
| 638 | DATA (RAMOON(1),1# 37, 72,/) DATA 424 |                 |                 |                 |                 | 6        |
| 639 | 461                                   | -3.1446918E-01, | -2.8701118E-01, | -2.4017651E-01, | -1.7830115E-01, | DATA 425 |
| 640 | 462                                   | -1.0680716E-01, | -3.1174711E-02, | 4.8764427E-02,  | 1.1412261E-01,  | DATA 426 |
| 641 | 463                                   | 1.7494315E-01,  | 2.3003354E-01,  | 2.9177193E-01,  | 3.8096050E-01,  | DATA 427 |
| 642 | 464                                   | 3.1675462E-01,  | 3.1866277E-01,  | 3.0659350E-01,  | 2.8091758E-01,  | DATA 428 |
| 643 | 465                                   | 2.4251622E-01,  | 1.9279933E-01,  | 1.8369178E-01,  | 6.7599810E-02,  | DATA 429 |
| 644 | 466                                   | -2.6887377E-03, | -7.3866340E-02, | -1.4249898E-01, | -2.8477504E-01, | DATA 430 |
| 645 | 467                                   | -2.5678233E-01, | -2.9471476E-01, | -3.1327281E-01, | -3.1620489E-01, | DATA 431 |
| 646 | 468                                   | -2.9684225E-01, | -2.5839554E-01, | -2.0383654E-01, | -1.8743780E-01, | DATA 432 |
| 647 | 469                                   | -6.4092183E-02, | 1.1306454E-02,  | 0.4328573E-02,  | 1.5126486E-01,  | DATA 433 |
| 648 | DATA (RAMOON(1),1# 73,108,/) DATA 434 |                 |                 |                 |                 | 6        |
| 649 | 471                                   | 2.0921546E-01,  | 2.5603004E-01,  | 2.9023199E-01,  | 3.1090478E-01,  | DATA 435 |
| 650 | 472                                   | 3.1760842E-01,  | 3.1032005E-01,  | 2.8939983E-01,  | 2.5558038E-01,  | DATA 436 |
| 651 | 473                                   | 2.0998013E-01,  | 1.5414112E-01,  | 9.0086393E-02,  | 2.8381234E-02,  | DATA 437 |
| 652 | 474                                   | -5.1828280E-02, | -1.2283542E-01, | -1.8849063E-01, | -2.4443182E-01, | DATA 438 |
| 653 | 475                                   | -2.8458382E-01, | -3.1147760E-01, | -3.1988439E-01, | -3.8259329E-01, | DATA 439 |
| 654 | 476                                   | -2.6950170E-01, | -2.2036120E-01, | -1.7882828E-01, | -8.9092195E-02, | DATA 440 |
| 655 | 477                                   | -1.5484304E-02, | 5.7810888E-02,  | 1.2696585E-01,  | 1.8868810E-01,  | DATA 441 |
| 656 | 478                                   | 2.4020533E-01,  | 2.7957648E-01,  | 3.8545783E-01,  | 3.1719460E-01,  | DATA 442 |
| 657 | 479                                   | 3.1471913E-01,  | 2.9844530E-01,  | 2.6915992E-01,  | 2.2794186E-01,  | DATA 443 |
| 658 | DATA (RAMOON(1),1#109,144,/) DATA 444 |                 |                 |                 |                 | 6        |
| 659 | 481                                   | 1.7613663E-01,  | 1.1539973E-01,  | 4.7806412E-02,  | -2.3997525E-02, | DATA 445 |
| 660 | 482                                   | -9.6455400E-02, | -1.6605311E-01, | -2.2747204E-01, | -2.7603246E-01, | DATA 446 |
| 661 | 483                                   | -3.0742636E-01, | -3.1876331E-01, | -3.0918866E-01, | -2.7997065E-01, | DATA 447 |
| 662 | 484                                   | -2.3404159E-01, | -1.7528028E-01, | -1.0787331E-01, | -3.9920438E-02, | DATA 448 |
| 663 | 485                                   | 3.6737205E-02,  | 1.0656702E-01,  | 1.7036823E-01,  | 2.2532320E-01,  | DATA 449 |
| 664 | 486                                   | 2.6808949E-01,  | 2.9991259E-01,  | 3.1671761E-01,  | 3.1913751E-01,  | DATA 450 |
| 665 | 487                                   | 3.0745376E-01,  | 2.8247591E-01,  | 2.4336368E-01,  | 1.9751704E-01,  | DATA 451 |
| 666 | 488                                   | 1.4050979E-03,  | 7.6130797E-02,  | 6.9176308E-03,  | -6.5639447E-02, | DATA 452 |
| 667 | 489                                   | -1.3688206E-01, | -2.8286793E-01, | -2.9852312E-01, | -2.9863149E-01, | DATA 453 |
| 668 | DATA (RAMOON(1),1#145,180,/) DATA 454 |                 |                 |                 |                 | 6        |
| 669 | 491                                   | -3.1887006E-01, | -3.1695587E-01, | -2.9330005E-01, | -2.5076521E-01, | DATA 455 |
| 670 | 492                                   | -1.9372233E-01, | -1.2699632E-01, | -5.5149327E-02, | 1.7810669E-02,  | DATA 456 |
| 671 | 493                                   | 8.8435971E-02,  | 1.5373397E-01,  | 2.1107271E-01,  | 2.5813867E-01,  | DATA 457 |
| 672 | 494                                   | 2.9309954E-01,  | 3.1452340E-01,  | 3.2169860E-01,  | 3.1459093E-01,  | DATA 458 |



|     |     |                    |                |                |                |          |
|-----|-----|--------------------|----------------|----------------|----------------|----------|
| 473 | 495 | 2.9382046E-01,     | 2.6052708E-01, | 2.1619656E-01, | 1.6251323E-01, | DATA 459 |
| 474 | 496 | 1.0128928E-01,     | 3.4494885E-02, | 3.5609255E-02, | 1.8628072E-01, | DATA 460 |
| 475 | 497 | 1.7396207E-01,     | 2.3434347E-01, | 2.8231703E-01, | 3.1223805E-01, | DATA 461 |
| 476 | 498 | 3.2159476E-01,     | 3.0729960E-01, | 2.8131872E-01, | 2.1769319E-01, | DATA 462 |
| 477 | 499 | 1.5179929E-01,     | 7.9109685E-02, | 4.4460779E-03, | 6.8248772E-02, | DATA 463 |
| 478 |     | DATA (BCHMOON(1)), | 1.1811216E-01, |                |                | DATA 464 |
| 479 | 501 | 1.3580630E-01,     | 1.9566925E-01, | 2.4569923E-01, | 2.8412068E-01, | DATA 465 |
| 480 | 502 | 3.0954556E-01,     | 3.2106979E-01, | 3.1837829E-01, | 3.9179754E-01, | DATA 466 |
| 481 | 503 | 2.7325889E-01,     | 2.3117892E-01, | 1.8030388E-01, | 1.2187971E-01, | DATA 467 |
| 482 | 504 | 5.7064522E-02,     | 1.1011114E-02, | 8.0178712E-02, | 1.4751543E-01, | DATA 468 |
| 483 | 505 | 2.0950132E-01,     | 2.6189837E-01, | 2.9997320E-01, | 3.1917887E-01, | DATA 469 |
| 484 | 506 | 3.1628681E-01,     | 2.9057715E-01, | 2.4430598E-01, | 1.8218191E-01, | DATA 470 |
| 485 | 507 | 1.0995989E-01,     | 3.3509700E-02, | 4.8232532E-02, | 1.1334859E-01, | DATA 471 |
| 486 | 508 | 1.7484563E-01,     | 2.3049314E-01, | 2.9258112E-01, | 3.8183834E-01, | DATA 472 |
| 487 | 509 | 3.1741134E-01,     | 3.1891007E-01, | 3.8646697E-01, | 2.8076260E-01, | DATA 473 |
| 488 |     | DATA (BCHMOON(1)), | 1.217252E-01,  |                |                | DATA 474 |
| 489 | 511 | 2.4299352E-01,     | 1.9478740E-01, | 1.3809537E-01, | 7.5099055E-02, | DATA 475 |
| 490 | 512 | 8.1530959E-03,     | 6.0180007E-02, | 1.2711343E-01, | 1.8949563E-01, | DATA 476 |
| 491 | 513 | 2.4173689E-01,     | 2.8587120E-01, | 3.1185400E-01, | 3.1822778E-01, | DATA 477 |
| 492 | 514 | 3.0304269E-01,     | 2.6663647E-01, | 2.1194427E-01, | 1.4374670E-01, | DATA 478 |
| 493 | 515 | 6.7842641E-02,     | 1.8070806E-02, | 8.5059434E-02, | 1.9322783E-01, | DATA 479 |
| 494 | 516 | 2.1169927E-01,     | 2.5845802E-01, | 2.9216097E-01, | 3.1202826E-01, | DATA 480 |
| 495 | 517 | 3.1773568E-01,     | 3.0942670E-01, | 2.8767099E-01, | 2.5346759E-01, | DATA 481 |
| 496 | 518 | 2.0821797E-01,     | 1.5369207E-01, | 7.1992377E-02, | 2.5523633E-02, | DATA 482 |
| 497 | 519 | 4.3026286E-02,     | 1.1069387E-01, | 1.9426396E-01, | 2.3019481E-01, | DATA 483 |
| 498 |     | DATA (BCHMOON(1)), | 1.253288E-01,  |                |                | DATA 484 |
| 499 | 521 | 2.7491291E-01,     | 3.0484520E-01, | 3.1693827E-01, | 3.8921073E-01, | DATA 485 |
| 500 | 522 | 2.8131327E-01,     | 2.3483232E-01, | 1.7317330E-01, | 1.8105566E-01, | DATA 486 |
| 501 | 523 | 2.3808904E-02,     | 5.3313240E-02, | 1.2565117E-01, | 1.8943475E-01, | DATA 487 |
| 502 | 524 | 2.4187671E-01,     | 2.8112754E-01, | 3.0619871E-01, | 3.1662439E-01, | DATA 488 |
| 503 | 525 | 3.1272791E-01,     | 2.9510638E-01, | 2.6474178E-01, | 2.2290694E-01, | DATA 489 |
| 504 | 526 | 1.7115063E-01,     | 1.1131959E-01, | 4.5806497E-02, | 2.3395644E-02, | DATA 490 |
| 505 | 527 | 9.2459008E-02,     | 1.5873598E-01, | 2.1785620E-01, | 2.6613787E-01, | DATA 491 |
| 506 | 528 | 2.9993153E-01,     | 3.1627864E-01, | 3.1339429E-01, | 2.9101966E-01, | DATA 492 |
| 507 | 529 | 2.5051833E-01,     | 1.9468645E-01, | 1.2737976E-01, | 5.3089065E-02, | DATA 493 |
| 508 |     | DATA (BCHMOON(1)), | 1.289324E-01,  |                |                | DATA 494 |
| 509 | 531 | 2.3483267E-02,     | 9.7739230E-02, | 1.6553165E-01, | 2.2339293E-01, | DATA 495 |
| 510 | 532 | 2.6871232E-01,     | 2.9981608E-01, | 3.1594581E-01, | 3.1714354E-01, | DATA 496 |
| 511 | 533 | 3.0407270E-01,     | 2.7782194E-01, | 2.3973983E-01, | 1.9133827E-01, | DATA 497 |
| 512 | 534 | 1.3427949E-01,     | 7.0441874E-02, | 2.0440903E-03, | 6.8208682E-02, | DATA 498 |
| 513 | 535 | 1.3701063E-01,     | 2.8044820E-01, | 2.9418644E-01, | 2.9391113E-01, | DATA 499 |
| 514 | 536 | 3.1599786E-01,     | 3.1822827E-01, | 3.0026076E-01, | 2.6363681E-01, | DATA 500 |
| 515 | 537 | 2.1135818E-01,     | 1.4728946E-01, | 7.564602E-02,  | 6.6506120E-04, | DATA 501 |
| 516 | 538 | 7.3547381E-02,     | 1.4313460E-01, | 2.0459882E-01, | 2.5496305E-01, | DATA 502 |
| 517 | 539 | 2.9195773E-01,     | 3.1417789E-01, | 3.2114543E-01, | 3.1323697E-01, | DATA 503 |
| 518 |     | DATA (BCHMOON(1)), | 1.325360E-01,  |                |                | DATA 504 |
| 519 | 541 | 2.9149242E-01,     | 2.5737093E-01, | 2.1253329E-01, | 1.5871084E-01, | DATA 505 |
| 520 | 542 | 9.7684067E-02,     | 3.1366293E-02, | 3.8028877E-02, | 1.8777423E-01, | DATA 506 |
| 521 | 543 | 1.7443552E-01,     | 2.3380964E-01, | 2.8114913E-01, | 3.180177E-01,  | DATA 507 |
| 522 | 544 | 3.2220864E-01,     | 3.1089116E-01, | 2.7888879E-01, | 2.2938936E-01, | DATA 508 |
| 523 | 545 | 1.6482571E-01,     | 9.5963879E-02, | 2.1322523E-02, | 5.3046796E-02, | DATA 509 |
| 524 | 546 | 1.2355897E-01,     | 1.8703146E-01, | 2.4066379E-01, | 2.8210714E-01, | DATA 510 |
| 525 | 547 | 3.0961112E-01,     | 3.2218648E-01, | 3.1969824E-01, | 3.8282657E-01, | DATA 511 |
| 526 | 548 | 2.7289519E-01,     | 2.3162983E-01, | 1.8093217E-01, | 1.2273856E-01, | DATA 512 |
| 527 | 549 | 5.8976965E-02,     | 8.3369481E-03, | 9.6952303E-02, | 1.4414669E-01, | DATA 513 |
| 528 |     | DATA (BCHMOON(1)), | 1.361368E-01,  |                |                | DATA 514 |
| 529 | 551 | 2.0650593E-01,     | 2.5982629E-01, | 2.9932990E-01, | 3.2037714E-01, | DATA 515 |
| 530 | 552 | 3.1963737E-01,     | 2.9625164E-01, | 2.5228047E-01, | 1.9211900E-01, | DATA 516 |
| 531 |     | DATA (BCHMOON(1)), | 1.36E-01,      |                |                | DATA 516 |
| 532 | 561 | 6.1808866E-01,     | 6.1101402E-01, | 6.0296631E-01, | 5.9423984E-01, | DATA 517 |
| 533 | 562 | 5.8825339E-01,     | 5.7675222E-01, | 5.8934244E-01, | 5.6382106E-01, | DATA 518 |
| 534 | 563 | 5.6084142E-01,     | 5.6082237E-01, | 5.8384968E-01, | 5.6964789E-01, | DATA 519 |
| 535 | 564 | 5.7763357E-01,     | 5.8702874E-01, | 5.9692461E-01, | 6.8674790E-01, | DATA 520 |
| 536 | 565 | 6.1564023E-01,     | 6.2319873E-01, | 6.2913439E-01, | 6.8332761E-01, | DATA 521 |
| 537 | 566 | 6.3879979E-01,     | 6.3667728E-01, | 6.3615273E-01, | 6.3444601E-01, | DATA 522 |
| 538 | 567 | 6.3176974E-01,     | 6.2830192E-01, | 6.2416922E-01, | 6.1944465E-01, | DATA 523 |
| 539 | 568 | 6.1416084E-01,     | 6.0833718E-01, | 6.8201674E-01, | 5.9530783E-01, | DATA 524 |
| 540 | 569 | 5.8842214E-01,     | 5.8169846E-01, | 5.9560039E-01, | 5.8067985E-01, | DATA 525 |
| 541 |     | DATA (BCHMOON(1)), | 1.37721E-01,   |                |                | DATA 526 |
| 542 | 571 | 5.6750383E-01,     | 5.665295E-01,  | 5.8811531E-01, | 5.7220797E-01, | DATA 527 |
| 543 | 572 | 5.7855330E-01,     | 5.8661828E-01, | 5.9570153E-01, | 6.8503983E-01, | DATA 528 |
| 544 | 573 | 6.1390621E-01,     | 6.2168383E-01, | 6.2790987E-01, | 6.1229471E-01, | DATA 529 |
| 545 | 574 | 6.3472001E-01,     | 6.3522323E-01, | 6.8397241E-01, | 6.8125424E-01, | DATA 530 |

|     |                               |                |                |                |                |          |
|-----|-------------------------------|----------------|----------------|----------------|----------------|----------|
| 946 | 575                           | 6.2733727E 01, | 6.2263223E 01, | 6.2745316E 01, | 6.2288399E 01, | DATA 531 |
| 947 | 576                           | 6.0673705E 01, | 6.0154732E 01, | 6.9658475E 01, | 6.9188281E 01, | DATA 532 |
| 948 | 577                           | 5.8747762E 01, | 5.8344873E 01, | 5.9994925E 01, | 5.7721531E 01, | DATA 533 |
| 949 | 578                           | 5.7854714E 01, | 5.7926134E 01, | 5.7662214E 01, | 5.7976830E 01, | DATA 534 |
| 950 | 579                           | 5.8463715E 01, | 5.9104300E 01, | 5.9849605E 01, | 6.0649510E 01, | DATA 535 |
| 951 | DATA (RMOON I), I=73, 108, /  |                |                |                |                | DATA 536 |
| 952 | 581                           | 6.1429894E 01, | 6.2142914E 01, | 6.2728194E 01, | 6.8147331E 01, | DATA 537 |
| 953 | 582                           | 6.3372683E 01, | 6.3393625E 01, | 6.3215538E 01, | 6.2858711E 01, | DATA 538 |
| 954 | 583                           | 6.2386227E 01, | 6.1750830E 01, | 6.3090816E 01, | 6.8425149E 01, | DATA 539 |
| 955 | 584                           | 5.9798297E 01, | 5.9245629E 01, | 5.8790307E 01, | 5.8442486E 01, | DATA 540 |
| 956 | 585                           | 5.8201079E 01, | 5.8057681E 01, | 5.8001381E 01, | 5.8024427E 01, | DATA 541 |
| 957 | 586                           | 5.8123228E 01, | 5.8300885E 01, | 5.8564150E 01, | 5.8919820E 01, | DATA 542 |
| 958 | 587                           | 5.9368944E 01, | 5.9704619E 01, | 6.0307544E 01, | 6.3140942E 01, | DATA 543 |
| 959 | 588                           | 6.1782610E 01, | 6.2368864E 01, | 6.2859316E 01, | 6.3211688E 01, | DATA 544 |
| 960 | 589                           | 6.3392041E 01, | 6.3378171E 01, | 6.3162038E 01, | 6.2751194E 01, | DATA 545 |
| 961 | DATA (RMOON I), I=109, 144, / |                |                |                |                | DATA 546 |
| 962 | 591                           | 6.2169180E 01, | 6.1454685E 01, | 6.0639244E 01, | 5.9843220E 01, | DATA 547 |
| 963 | 592                           | 5.9070027E 01, | 5.8398987E 01, | 5.7877869E 01, | 5.7536746E 01, | DATA 548 |
| 964 | 593                           | 5.7384923E 01, | 5.7411933E 01, | 5.7592371E 01, | 5.7893024E 01, | DATA 549 |
| 965 | 594                           | 5.8280165E 01, | 5.8723121E 01, | 5.9207089E 01, | 5.9713111E 01, | DATA 550 |
| 966 | 595                           | 6.0235767E 01, | 6.0769596E 01, | 6.1307320E 01, | 6.1836834E 01, | DATA 551 |
| 967 | 596                           | 6.2339558E 01, | 6.2790484E 01, | 6.3159611E 01, | 6.3415034E 01, | DATA 552 |
| 968 | 597                           | 6.3826185E 01, | 6.3467767E 01, | 6.3223358E 01, | 6.2788610E 01, | DATA 553 |
| 969 | 598                           | 6.2173813E 01, | 6.1405581E 01, | 6.0327264E 01, | 5.9597486E 01, | DATA 554 |
| 970 | 599                           | 5.8686276E 01, | 5.7858423E 01, | 5.7214292E 01, | 5.6779447E 01, | DATA 555 |
| 971 | DATA (RMOON I), I=145, 180, / |                |                |                |                | DATA 556 |
| 972 | 601                           | 5.6895620E 01, | 5.6665945E 01, | 5.6766171E 01, | 5.7451472E 01, | DATA 557 |
| 973 | 602                           | 5.9066417E 01, | 5.8755023E 01, | 5.9468433E 01, | 6.0169161E 01, | DATA 558 |
| 974 | 603                           | 6.0831964E 01, | 6.1442056E 01, | 6.1991890E 01, | 6.2477853E 01, | DATA 559 |
| 975 | 604                           | 6.2894213E 01, | 6.3235382E 01, | 6.3489453E 01, | 6.3640733E 01, | DATA 560 |
| 976 | 605                           | 6.3670595E 01, | 6.3559880E 01, | 6.3829283E 01, | 6.2856993E 01, | DATA 561 |
| 977 | 606                           | 6.2254381E 01, | 6.1497335E 01, | 6.0614893E 01, | 5.9653865E 01, | DATA 562 |
| 978 | 607                           | 5.8675492E 01, | 5.7756553E 01, | 5.6976853E 01, | 5.6410805E 01, | DATA 563 |
| 979 | 608                           | 5.6114398E 01, | 5.6114511E 01, | 5.6403792E 01, | 5.6943111E 01, | DATA 564 |
| 980 | 609                           | 5.7670615E 01, | 5.8514040E 01, | 5.9402487E 01, | 6.0275026E 01, | DATA 565 |
| 981 | DATA (RMOON I), I=181, 216, / |                |                |                |                | DATA 566 |
| 982 | 611                           | 6.1685312E 01, | 6.1802574E 01, | 6.2409932E 01, | 6.2901355E 01, | DATA 567 |
| 983 | 612                           | 6.3277668E 01, | 6.3542910E 01, | 6.3700834E 01, | 6.3752559E 01, | DATA 568 |
| 984 | 613                           | 6.3695502E 01, | 6.3523553E 01, | 6.3228419E 01, | 6.2802143E 01, | DATA 569 |
| 985 | 614                           | 6.2240582E 01, | 6.1547287E 01, | 6.0737263E 01, | 5.9840132E 01, | DATA 570 |
| 986 | 615                           | 5.8901946E 01, | 5.7984584E 01, | 5.7161683E 01, | 5.6510820E 01, | DATA 571 |
| 987 | 616                           | 5.6100358E 01, | 5.5979477E 01, | 5.6164760E 01, | 5.6637572E 01, | DATA 572 |
| 988 | 617                           | 5.7347595E 01, | 5.8223120E 01, | 5.9184025E 01, | 6.0153581E 01, | DATA 573 |
| 989 | 618                           | 6.1066791E 01, | 6.1874812E 01, | 6.2546021E 01, | 6.3064604E 01, | DATA 574 |
| 990 | 619                           | 6.3427789E 01, | 6.3642507E 01, | 6.3720388E 01, | 6.3677084E 01, | DATA 575 |
| 991 | DATA (RMOON I), I=217, 252, / |                |                |                |                | DATA 576 |
| 992 | 621                           | 6.3525226E 01, | 6.3275335E 01, | 6.2933643E 01, | 6.2502605E 01, | DATA 577 |
| 993 | 622                           | 6.1982653E 01, | 6.1375195E 01, | 6.0886319E 01, | 5.9930655E 01, | DATA 578 |
| 994 | 623                           | 5.9134757E 01, | 5.8339093E 01, | 5.7597507E 01, | 5.6973199E 01, | DATA 579 |
| 995 | 624                           | 5.6830885E 01, | 5.6325985E 01, | 5.6393203E 01, | 5.6737967E 01, | DATA 580 |
| 996 | 625                           | 5.7333796E 01, | 5.8126612E 01, | 5.9044352E 01, | 6.0008852E 01, | DATA 581 |
| 997 | 626                           | 6.0944765E 01, | 6.1790040E 01, | 6.2497180E 01, | 6.3038211E 01, | DATA 582 |
| 998 | 627                           | 6.3393739E 01, | 6.3570894E 01, | 6.3580434E 01, | 6.3443301E 01, | DATA 583 |
| 999 | 628                           | 6.3184915E 01, | 6.2831533E 01, | 6.2407191E 01, | 6.1931237E 01, | DATA 584 |
| 000 | 629                           | 6.1417530E 01, | 6.0874000E 01, | 6.0309167E 01, | 5.9726450E 01, | DATA 585 |
| 001 | DATA (RMOON I), I=253, 288, / |                |                |                |                | DATA 586 |
| 002 | 631                           | 5.9136883E 01, | 5.8558200E 01, | 5.8018152E 01, | 5.7534114E 01, | DATA 587 |
| 003 | 632                           | 5.7210250E 01, | 5.7031062E 01, | 5.7052916E 01, | 5.7229537E 01, | DATA 588 |
| 004 | 633                           | 5.7754969E 01, | 5.8403458E 01, | 5.9191179E 01, | 6.0054245E 01, | DATA 589 |
| 005 | 634                           | 6.0923375E 01, | 6.1732225E 01, | 6.2423885E 01, | 6.2955173E 01, | DATA 590 |
| 006 | 635                           | 6.3298841E 01, | 6.3444051E 01, | 6.3539514E 01, | 6.3171602E 01, | DATA 591 |
| 007 | 636                           | 6.2801584E 01, | 6.2322104E 01, | 6.1773321E 01, | 6.1194240E 01, | DATA 592 |
| 008 | 637                           | 6.0619154E 01, | 6.0074443E 01, | 5.9577198E 01, | 5.9135791E 01, | DATA 593 |
| 009 | 638                           | 5.8752397E 01, | 5.8428878E 01, | 5.8161042E 01, | 5.7962011E 01, | DATA 594 |
| 010 | 639                           | 5.7843620E 01, | 5.7325202E 01, | 5.6927749E 01, | 5.6168266E 01, | DATA 595 |
| 011 | DATA (RMOON I), I=289, 324, / |                |                |                |                | DATA 596 |
| 012 | 641                           | 5.8553786E 01, | 5.9076755E 01, | 5.9715192E 01, | 6.0423831E 01, | DATA 597 |
| 013 | 642                           | 6.1158603E 01, | 6.1861986E 01, | 6.2479303E 01, | 6.2962180E 01, | DATA 598 |
| 014 | 643                           | 6.3272868E 01, | 6.3387242E 01, | 6.3296575E 01, | 6.3008140E 01, | DATA 599 |
| 015 | 644                           | 6.2844717E 01, | 6.1942945E 01, | 6.1250405E 01, | 6.0521374E 01, | DATA 600 |
| 016 | 645                           | 5.9811362E 01, | 5.9170955E 01, | 5.8639953E 01, | 5.8245143E 01, | DATA 601 |
| 017 | 646                           | 5.7988799E 01, | 5.7870476E 01, | 5.7871586E 01, | 5.7971656E 01, | DATA 602 |
| 018 | 647                           | 5.8151054E 01, | 5.8396969E 01, | 5.8702725E 01, | 5.9067436E 01, | DATA 603 |



|     |     |                             |                |                |                |          |   |
|-----|-----|-----------------------------|----------------|----------------|----------------|----------|---|
| 619 | 648 | 5.9492424E 01,              | 5.9976871E 01, | 6.0513770E 01, | 6.1087178E 01, | DATA 604 |   |
| 620 | 649 | 6.1471446E 01,              | 6.2232461E 01, | 6.2730600E 01, | 6.3124756E 01, | DATA 605 |   |
| 621 |     | DATA (RMOON (1),1,325.360)/ |                |                |                | DATA 606 | 6 |
| 622 | 651 | 6.3276644E 01,              | 6.3455024E 01, | 6.3339281E 01, | 6.3022828E 01, | DATA 607 |   |
| 623 | 652 | 6.2812719E 01,              | 6.1835756E 01, | 6.1033294E 01, | 6.0161805E 01, | DATA 608 |   |
| 624 | 653 | 5.9288254E 01,              | 5.8483591E 01, | 5.7814211E 01, | 5.7332702E 01, | DATA 609 |   |
| 625 | 654 | 5.7070049E 01,              | 5.7031700E 01, | 5.6198844E 01, | 5.5534605E 01, | DATA 610 |   |
| 626 | 655 | 5.7993026E 01,              | 5.8528132E 01, | 5.9100784E 01, | 5.9682307E 01, | DATA 611 |   |
| 627 | 656 | 6.0254539E 01,              | 6.0809141E 01, | 6.1340840E 01, | 6.1846305E 01, | DATA 612 |   |
| 628 | 657 | 6.2319070E 01,              | 6.2747398E 01, | 6.3113359E 01, | 6.3393830E 01, | DATA 613 |   |
| 629 | 658 | 6.3361106E 01,              | 6.3589022E 01, | 6.3843613E 01, | 6.4138475E 01, | DATA 614 |   |
| 630 | 659 | 6.2638177E 01,              | 6.1961598E 01, | 6.1136493E 01, | 6.0200733E 01, | DATA 615 |   |
| 631 |     | DATA (RMOON (1),1,361.368)/ |                |                |                | DATA 616 | 6 |
| 632 | 661 | 5.9221506E 01,              | 5.8271678E 01, | 5.7432717E 01, | 5.6782223E 01, | DATA 617 |   |
| 633 | 662 | 5.6381576E 01,              | 5.6264833E 01, | 5.6432617E 01, | 5.6853314E 01, | DATA 618 |   |
| 634 |     | END                         |                |                |                | DATA 619 | 6 |

29748 WORDS OF MEMORY USED BY THIS COMPILATION

71084 02 11-03-72 11.801 1978 EPHEMERIS

## PREFACE

|               |      |
|---------------|------|
| PROGRAM BREAK | 4273 |
| COMMON LENGTH | 0    |
| V COUNT BITS  | 5    |

PRIMARY SYMDEF ENTRY

TABLE 0

SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1 EPHBLK 11

SYMREF

END OF BINARY CARD \*1978\*19  
 4273 IS THE NEXT AVAILABLE LOCATION.  
 GMAP VERSION/ASSEMBLY DATES JMAP 110171/102971 JMPB 110171/102971 JMPG 110171/102971  
 THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
 \*\* 19411 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

71084 03 11-03-72 11.813 1979 EPHEMERIS

|    |                                                                       |                |                |                |                |         |
|----|-----------------------------------------------------------------------|----------------|----------------|----------------|----------------|---------|
| 1  | C*1979*                                                               | 1979 EPHEMERIS | DATA           | 1              |                |         |
| 2  | SUBROUTINE TABLE                                                      |                |                | DATA 2         |                |         |
| 3  | DIMENSION CASUN (369), DCSUN (369), RSUN (369)                        |                |                | DATA 3         |                |         |
| 4  | DIMENSION RMOON (369), DCMOON (369), RMOON (369)                      |                |                | DATA 4         |                |         |
| 5  | DIMENSION ARRAY (2214)                                                |                |                |                |                |         |
| 6  | DOUBLE PRECISION V                                                    |                |                |                |                |         |
| 7  | EQUIVALENCE (RASUN, ARRAY), (DCSUN, ARRAY (370)), (RSUN, ARRAY (739)) |                |                |                |                |         |
| 8  | EQUIVALENCE (RMOON, ARRAY (1108)), (DCMOON, ARRAY (1477))             |                |                |                |                |         |
| 9  | EQUIVALENCE (RMOON, ARRAY (1846))                                     |                |                |                |                |         |
| 10 | COMMON, EPHBLK, V (4), I                                              |                |                |                |                |         |
| 11 | Y (1) = ARRAY (1)                                                     |                |                |                |                |         |
| 12 | Y (2) = ARRAY (1+1)                                                   |                |                | 2              |                |         |
| 13 | Y (3) = ARRAY (1+2)                                                   |                |                | 3              |                |         |
| 14 | Y (4) = ARRAY (1+3)                                                   |                |                | 4              |                |         |
| 15 | RETURN                                                                |                |                | 5              |                |         |
| 16 | DATA (RASUN (1),1, 1, 361/                                            |                |                | 6              |                |         |
| 17 | 11                                                                    | 4.8822881E 00, | 4.9015869E 00, | 4.9208634E 00, | 4.9401150E 00, | DATA 7  |
| 18 | 12                                                                    | 4.9593388E 00, | 4.9789330E 00, | 4.9976955E 00, | 5.0168245E 00, | DATA 8  |
| 19 | 13                                                                    | 5.0359179E 00, | 5.0549741E 00, | 5.0739913E 00, | 5.0929679E 00, | DATA 9  |
| 20 | 14                                                                    | 5.1119024E 00, | 5.1307933E 00, | 5.1496392E 00, | 5.1684390E 00, | DATA 10 |
| 21 | 15                                                                    | 5.1871912E 00, | 5.2058949E 00, | 5.2245491E 00, | 5.2431827E 00, | DATA 11 |
| 22 | 16                                                                    | 5.2617049E 00, | 5.2802048E 00, | 5.2986516E 00, | 5.3170447E 00, | DATA 12 |
| 23 | 17                                                                    | 5.3353834E 00, | 5.3536667E 00, | 5.3718937E 00, | 5.3900635E 00, | DATA 13 |

|    |    |                                 |                 |                |                |      |    |
|----|----|---------------------------------|-----------------|----------------|----------------|------|----|
| 24 | 18 | 5.4081793E 00,                  | 5.4262292E 00,  | 5.4442214E 00, | 5.4621544E 00, | DATA | 14 |
| 25 | 19 | 5.4800267E 00,                  | 5.4976302E 00,  | 5.5155889E 00, | 5.5332791E 00, | DATA | 15 |
| 26 |    | DATA (RASUN (I), I) = 37.721/   |                 |                |                | DATA | 16 |
| 27 | 21 | 5.5909085E 00,                  | 5.5684777E 00,  | 5.5859871E 00, | 5.6034371E 00, | DATA | 17 |
| 28 | 22 | 5.6208282E 00,                  | 5.6381610E 00,  | 5.6554354E 00, | 5.6726532E 00, | DATA | 18 |
| 29 | 23 | 5.6898181E 00,                  | 5.7069262E 00,  | 5.7239806E 00, | 5.7409822E 00, | DATA | 19 |
| 30 | 24 | 5.7279322E 00,                  | 5.7448318E 00,  | 5.7616820E 00, | 5.7804841E 00, | DATA | 20 |
| 31 | 25 | 5.8252393E 00,                  | 5.8419464E 00,  | 5.8586124E 00, | 5.8752320E 00, | DATA | 21 |
| 32 | 26 | 5.8918083E 00,                  | 5.9083421E 00,  | 5.9248340E 00, | 5.9412851E 00, | DATA | 22 |
| 33 | 27 | 5.9876962E 00,                  | 5.9740665E 00,  | 5.9904034E 00, | 6.0067016E 00, | DATA | 23 |
| 34 | 28 | 6.0229650E 00,                  | 6.0391943E 00,  | 6.0553911E 00, | 6.0715568E 00, | DATA | 24 |
| 35 | 29 | 6.0876930E 00,                  | 6.1038010E 00,  | 6.1198826E 00, | 6.1359894E 00, | DATA | 25 |
| 36 |    | DATA (RASUN (I), I) = 73.1081/  |                 |                |                | DATA | 26 |
| 37 | 31 | 6.1519729E 00,                  | 6.1679850E 00,  | 6.1839775E 00, | 6.1999519E 00, | DATA | 27 |
| 38 | 32 | 6.2159103E 00,                  | 6.2318543E 00,  | 6.2477856E 00, | 6.2637060E 00, | DATA | 28 |
| 39 | 33 | 6.2796172E 00,                  | 1.2335213E-02,  | 2.8232037E-02, | 4.4123732E-02, | DATA | 29 |
| 40 | 34 | 6.0011829E-02,                  | 7.5897319E-02,  | 9.1781423E-02, | 1.0766835E-01, | DATA | 30 |
| 41 | 35 | 1.2355029E-01,                  | 1.3943751E-01,  | 1.5532820E-01, | 1.7122354E-01, | DATA | 31 |
| 42 | 36 | 1.8712451E-01,                  | 2.0303247E-01,  | 2.2894870E-01, | 2.5487349E-01, | DATA | 32 |
| 43 | 37 | 2.5081110E-01,                  | 2.6675999E-01,  | 2.8272259E-01, | 2.9870028E-01, | DATA | 33 |
| 44 | 38 | 3.1469452E-01,                  | 3.3070688E-01,  | 3.4673886E-01, | 3.6279200E-01, | DATA | 34 |
| 45 | 39 | 3.7886769E-01,                  | 3.9496753E-01,  | 4.1109289E-01, | 4.2724517E-01, | DATA | 35 |
| 46 |    | DATA (RASUN (I), I) = 109.1441/ |                 |                |                | DATA | 36 |
| 47 | 41 | 4.4342566E-01,                  | 4.5963542E-01,  | 4.7587545E-01, | 4.9214674E-01, | DATA | 37 |
| 48 | 42 | 5.0845045E-01,                  | 5.2478717E-01,  | 5.4115763E-01, | 5.5756257E-01, | DATA | 38 |
| 49 | 43 | 5.7400261E-01,                  | 5.9047830E-01,  | 6.0699008E-01, | 6.2353832E-01, | DATA | 39 |
| 50 | 44 | 6.4012319E-01,                  | 6.5674520E-01,  | 6.7340467E-01, | 6.9010202E-01, | DATA | 40 |
| 51 | 45 | 7.0683751E-01,                  | 7.2361165E-01,  | 7.4042480E-01, | 7.5727742E-01, | DATA | 41 |
| 52 | 46 | 7.7416984E-01,                  | 7.9110261E-01,  | 8.0807612E-01, | 8.2509087E-01, | DATA | 42 |
| 53 | 47 | 8.4214690E-01,                  | 8.5924488E-01,  | 8.7638499E-01, | 8.9356738E-01, | DATA | 43 |
| 54 | 48 | 9.1079219E-01,                  | 9.2803925E-01,  | 9.4533683E-01, | 9.6271943E-01, | DATA | 44 |
| 55 | 49 | 9.8011225E-01,                  | 9.9754620E-01,  | 1.0150208E 00, | 1.0325352E 00, | DATA | 45 |
| 56 |    | DATA (RASUN (I), I) = 145.1801/ |                 |                |                | DATA | 46 |
| 57 | 51 | 1.0500890E 00,                  | 1.0676809E 00,  | 1.0853310E 00, | 1.1029753E 00, | DATA | 47 |
| 58 | 52 | 1.1206751E 00,                  | 1.1384085E 00,  | 1.1561742E 00, | 1.1739709E 00, | DATA | 48 |
| 59 | 53 | 1.1917973E 00,                  | 1.2096522E 00,  | 1.2275344E 00, | 1.2454427E 00, | DATA | 49 |
| 60 | 54 | 1.2633759E 00,                  | 1.2813327E 00,  | 1.2993120E 00, | 1.3173127E 00, | DATA | 50 |
| 61 | 55 | 1.3353334E 00,                  | 1.3533731E 00,  | 1.3714304E 00, | 1.3895043E 00, | DATA | 51 |
| 62 | 56 | 1.4075933E 00,                  | 1.4256959E 00,  | 1.4438109E 00, | 1.4619367E 00, | DATA | 52 |
| 63 | 57 | 1.4800722E 00,                  | 1.4982156E 00,  | 1.5163652E 00, | 1.5345192E 00, | DATA | 53 |
| 64 | 58 | 1.5526760E 00,                  | 1.5708334E 00,  | 1.5889896E 00, | 1.6071423E 00, | DATA | 54 |
| 65 | 59 | 1.6252894E 00,                  | 1.6434289E 00,  | 1.6615589E 00, | 1.6796773E 00, | DATA | 55 |
| 66 |    | DATA (RASUN (I), I) = 181.2161/ |                 |                |                | DATA | 56 |
| 67 | 61 | 1.6977822E 00,                  | 1.7158719E 00,  | 1.7339445E 00, | 1.7519985E 00, | DATA | 57 |
| 68 | 62 | 1.7700321E 00,                  | 1.7880439E 00,  | 1.8060326E 00, | 1.8239968E 00, | DATA | 58 |
| 69 | 63 | 1.8419350E 00,                  | 1.8598462E 00,  | 1.8777293E 00, | 1.8955833E 00, | DATA | 59 |
| 70 | 64 | 1.9134070E 00,                  | 1.9311996E 00,  | 1.9489602E 00, | 1.9666880E 00, | DATA | 60 |
| 71 | 65 | 1.9843826E 00,                  | 2.0020430E 00,  | 2.0196682E 00, | 2.0372575E 00, | DATA | 61 |
| 72 | 66 | 2.0548101E 00,                  | 2.0723249E 00,  | 2.0898008E 00, | 2.1072370E 00, | DATA | 62 |
| 73 | 67 | 2.1246325E 00,                  | 2.1419863E 00,  | 2.1592978E 00, | 2.1765662E 00, | DATA | 63 |
| 74 | 68 | 2.1937909E 00,                  | 2.2109713E 00,  | 2.2281071E 00, | 2.2451979E 00, | DATA | 64 |
| 75 | 69 | 2.2622435E 00,                  | 2.2792438E 00,  | 2.2961986E 00, | 2.3131082E 00, | DATA | 65 |
| 76 |    | DATA (RASUN (I), I) = 217.2521/ |                 |                |                | DATA | 66 |
| 77 | 71 | 2.3299724E 00,                  | 2.3467916E 00,  | 2.3635662E 00, | 2.3802965E 00, | DATA | 67 |
| 78 | 72 | 2.3969829E 00,                  | 2.4138261E 00,  | 2.4302270E 00, | 2.4467862E 00, | DATA | 68 |
| 79 | 73 | 2.4633051E 00,                  | 2.4797842E 00,  | 2.4962242E 00, | 2.5126259E 00, | DATA | 69 |
| 80 | 74 | 2.5289901E 00,                  | 2.54553173E 00, | 2.5616079E 00, | 2.5778624E 00, | DATA | 70 |
| 81 | 75 | 2.5940817E 00,                  | 2.6102661E 00,  | 2.6264162E 00, | 2.6425320E 00, | DATA | 71 |
| 82 | 76 | 2.6586168E 00,                  | 2.6746687E 00,  | 2.6906894E 00, | 2.7066799E 00, | DATA | 72 |
| 83 | 77 | 2.7226411E 00,                  | 2.7385739E 00,  | 2.7544795E 00, | 2.7703589E 00, | DATA | 73 |
| 84 | 78 | 2.7862130E 00,                  | 2.8020433E 00,  | 2.8178509E 00, | 2.8336371E 00, | DATA | 74 |
| 85 | 79 | 2.8494032E 00,                  | 2.8651509E 00,  | 2.8808819E 00, | 2.8965980E 00, | DATA | 75 |
| 86 |    | DATA (RASUN (I), I) = 253.2881/ |                 |                |                | DATA | 76 |
| 87 | 81 | 2.9123012E 00,                  | 2.9279930E 00,  | 2.9436750E 00, | 2.9593488E 00, | DATA | 77 |
| 88 | 82 | 2.9750161E 00,                  | 2.9906780E 00,  | 2.9963357E 00, | 3.0119907E 00, | DATA | 78 |
| 89 | 83 | 3.0376441E 00,                  | 3.0532973E 00,  | 3.0689515E 00, | 3.0846080E 00, | DATA | 79 |
| 90 | 84 | 3.1002682E 00,                  | 3.1159332E 00,  | 3.1316043E 00, | 3.1472830E 00, | DATA | 80 |
| 91 | 85 | 3.1629705E 00,                  | 3.1786680E 00,  | 3.1943770E 00, | 3.2100988E 00, | DATA | 81 |
| 92 | 86 | 3.2258345E 00,                  | 3.2415856E 00,  | 3.2573536E 00, | 3.2731399E 00, | DATA | 82 |
| 93 | 87 | 3.2889459E 00,                  | 3.3047732E 00,  | 3.3206242E 00, | 3.3365004E 00, | DATA | 83 |
| 94 | 88 | 3.3524040E 00,                  | 3.3683366E 00,  | 3.3843000E 00, | 3.4002959E 00, | DATA | 84 |
| 95 | 89 | 3.4163259E 00,                  | 3.4323913E 00,  | 3.4484934E 00, | 3.4646336E 00, | DATA | 85 |
| 96 |    | DATA (RASUN (I), I) = 289.3241/ |                 |                |                | DATA | 86 |
| 97 | 91 | 3.4808131E 00,                  | 3.4970332E 00,  | 3.5132950E 00, | 3.5295997E 00, | DATA | 87 |



|     |                                 |                 |                 |                 |                 |          |
|-----|---------------------------------|-----------------|-----------------|-----------------|-----------------|----------|
| 98  | 92                              | 3.5659485E 00,  | 3.5623425E 00,  | 3.5767825E 00,  | 3.5952896E 00,  | DATA 88  |
| 99  | 93                              | 3.6118048E 00,  | 3.6203889E 00,  | 3.6450227E 00,  | 3.6617070E 00,  | DATA 89  |
| 100 | 94                              | 3.6784424E 00,  | 3.6952297E 00,  | 3.7120697E 00,  | 3.7289632E 00,  | DATA 90  |
| 101 | 95                              | 3.7459109E 00,  | 3.7629138E 00,  | 3.7799732E 00,  | 3.7970901E 00,  | DATA 91  |
| 102 | 96                              | 3.8142654E 00,  | 3.8313002E 00,  | 3.8487952E 00,  | 3.8661813E 00,  | DATA 92  |
| 103 | 97                              | 3.8835692E 00,  | 3.9010491E 00,  | 3.9185915E 00,  | 3.9361965E 00,  | DATA 93  |
| 104 | 98                              | 3.9538644E 00,  | 3.9715953E 00,  | 3.9893891E 00,  | 4.0072458E 00,  | DATA 94  |
| 105 | 99                              | 4.0251651E 00,  | 4.0431467E 00,  | 4.0611901E 00,  | 4.0792947E 00,  | DATA 95  |
| 106 | DATA (RASUN (1)), I=325, 360, / |                 |                 |                 |                 | DATA 96  |
| 107 | 101                             | 4.0974600E 00,  | 4.1156851E 00,  | 4.1339689E 00,  | 4.1523140E 00,  | DATA 97  |
| 108 | 102                             | 4.1707082E 00,  | 4.1891614E 00,  | 4.2076686E 00,  | 4.2262288E 00,  | DATA 98  |
| 109 | 103                             | 4.2448405E 00,  | 4.2635029E 00,  | 4.2822150E 00,  | 4.3009757E 00,  | DATA 99  |
| 110 | 104                             | 4.3197838E 00,  | 4.3386382E 00,  | 4.3575374E 00,  | 4.3764803E 00,  | DATA 100 |
| 111 | 105                             | 4.3954654E 00,  | 4.4144908E 00,  | 4.4335549E 00,  | 4.4526860E 00,  | DATA 101 |
| 112 | 106                             | 4.4717922E 00,  | 4.4909614E 00,  | 4.5101617E 00,  | 4.5293909E 00,  | DATA 102 |
| 113 | 107                             | 4.5486469E 00,  | 4.5679273E 00,  | 4.5872297E 00,  | 4.6065815E 00,  | DATA 103 |
| 114 | 108                             | 4.6258904E 00,  | 4.6452435E 00,  | 4.6646078E 00,  | 4.6839805E 00,  | DATA 104 |
| 115 | 109                             | 4.7033586E 00,  | 4.7227392E 00,  | 4.7421196E 00,  | 4.7614971E 00,  | DATA 105 |
| 116 | DATA (RASUN (1)), I=361, 368, / |                 |                 |                 |                 | DATA 106 |
| 117 | 111                             | 4.7808607E 00,  | 4.8002324E 00,  | 4.8195857E 00,  | 4.8389266E 00,  | DATA 107 |
| 118 | 112                             | 4.8482526E 00,  | 4.8775616E 00,  | 4.8968516E 00,  | 4.9161204E 00,  | DATA 108 |
| 119 | DATA (BCSUN (1)), I=1, 361, /   |                 |                 |                 |                 | DATA 109 |
| 120 | 121                             | -4.0382315E-01, | -4.0255958E-01, | -4.0116213E-01, | -3.9963135E-01, | DATA 109 |
| 121 | 122                             | -3.9796803E-01, | -3.9617297E-01, | -3.9424705E-01, | -3.9219116E-01, | DATA 110 |
| 122 | 123                             | -3.9000639E-01, | -3.8769379E-01, | -3.8525450E-01, | -3.8268972E-01, | DATA 111 |
| 123 | 124                             | -3.8000069E-01, | -3.7718866E-01, | -3.7425496E-01, | -3.7120091E-01, | DATA 112 |
| 124 | 125                             | -3.6802796E-01, | -3.6473753E-01, | -3.6133110E-01, | -3.5781019E-01, | DATA 113 |
| 125 | 126                             | -3.5417638E-01, | -3.5043127E-01, | -3.4657653E-01, | -3.4261383E-01, | DATA 114 |
| 126 | 127                             | -3.3854498E-01, | -3.3437179E-01, | -3.3009616E-01, | -3.2572002E-01, | DATA 115 |
| 127 | 128                             | -3.2124522E-01, | -3.1667375E-01, | -3.1200753E-01, | -3.0724848E-01, | DATA 116 |
| 128 | 129                             | -3.0239868E-01, | -2.9745993E-01, | -2.9243430E-01, | -2.8732372E-01, | DATA 117 |
| 129 | DATA (BCSUN (1)), I=37, 72, /   |                 |                 |                 |                 | DATA 118 |
| 130 | 131                             | -2.8213026E-01, | -2.7685589E-01, | -2.7150264E-01, | -2.6607246E-01, | DATA 119 |
| 131 | 132                             | -2.6056737E-01, | -2.5498933E-01, | -2.4934035E-01, | -2.4362238E-01, | DATA 120 |
| 132 | 133                             | -2.3783736E-01, | -2.3198724E-01, | -2.2607400E-01, | -2.2009957E-01, | DATA 121 |
| 133 | 134                             | -2.1406506E-01, | -2.0797483E-01, | -2.0182846E-01, | -1.9562867E-01, | DATA 122 |
| 134 | 135                             | -1.8937748E-01, | -1.8307688E-01, | -1.7672896E-01, | -1.7033580E-01, | DATA 123 |
| 135 | 136                             | -1.6389933E-01, | -1.5742169E-01, | -1.5090491E-01, | -1.4435100E-01, | DATA 124 |
| 136 | 137                             | -1.3776203E-01, | -1.3113992E-01, | -1.2448663E-01, | -1.1780415E-01, | DATA 125 |
| 137 | 138                             | -1.1109448E-01, | -1.0435990E-01, | -9.7601149E-02, | -9.0821291E-02, | DATA 126 |
| 138 | 139                             | -8.4021795E-02, | -7.7204488E-02, | -7.0371182E-02, | -6.3523655E-02, | DATA 127 |
| 139 | DATA (BCSUN (1)), I=73, 108, /  |                 |                 |                 |                 | DATA 128 |
| 140 | 141                             | -5.6463693E-02, | -4.9793030E-02, | -4.2913393E-02, | -3.6026499E-02, | DATA 129 |
| 141 | 142                             | -2.9134062E-02, | -2.2237763E-02, | -1.5339302E-02, | -8.4403891E-03, | DATA 130 |
| 142 | 143                             | -1.5427264E-03, | 3.3518971E-03,  | 1.2241696E-02,  | 1.9124885E-02,  | DATA 131 |
| 143 | 144                             | 2.5999748E-02,  | 3.2864399E-02,  | 3.9717035E-02,  | 4.6555863E-02,  | DATA 132 |
| 144 | 145                             | 5.3379099E-02,  | 6.0184982E-02,  | 6.6971731E-02,  | 7.3737568E-02,  | DATA 133 |
| 145 | 146                             | 8.0480657E-02,  | 8.7199301E-02,  | 9.3891767E-02,  | 1.0055633E-01,  | DATA 134 |
| 146 | 147                             | 1.0719130E-01,  | 1.1379500E-01,  | 1.2036579E-01,  | 1.2690205E-01,  | DATA 135 |
| 147 | 148                             | 1.3340215E-01,  | 1.3986491E-01,  | 1.4628758E-01,  | 1.5266979E-01,  | DATA 136 |
| 148 | 149                             | 1.5900958E-01,  | 1.6530543E-01,  | 1.7155582E-01,  | 1.7775922E-01,  | DATA 137 |
| 149 | DATA (BCSUN (1)), I=109, 144, / |                 |                 |                 |                 | DATA 138 |
| 150 | 151                             | 1.8391401E-01,  | 1.9001865E-01,  | 1.9607151E-01,  | 2.0207093E-01,  | DATA 139 |
| 151 | 152                             | 2.0801537E-01,  | 2.1390311E-01,  | 2.1973253E-01,  | 2.2550197E-01,  | DATA 140 |
| 152 | 153                             | 2.3120984E-01,  | 2.3685445E-01,  | 2.4243424E-01,  | 2.4794750E-01,  | DATA 141 |
| 153 | 154                             | 2.5339257E-01,  | 2.5876789E-01,  | 2.6407180E-01,  | 2.6930274E-01,  | DATA 142 |
| 154 | 155                             | 2.7445909E-01,  | 2.7953936E-01,  | 2.8454202E-01,  | 2.8946555E-01,  | DATA 143 |
| 155 | 156                             | 2.9430851E-01,  | 2.9906944E-01,  | 3.0374894E-01,  | 3.0833966E-01,  | DATA 144 |
| 156 | 157                             | 3.1284619E-01,  | 3.1726525E-01,  | 3.2159554E-01,  | 3.2583873E-01,  | DATA 145 |
| 157 | 158                             | 3.2984515E-01,  | 3.3404060E-01,  | 3.3800264E-01,  | 3.4186935E-01,  | DATA 146 |
| 158 | 159                             | 3.4563948E-01,  | 3.4931171E-01,  | 3.5288478E-01,  | 3.5632749E-01,  | DATA 147 |
| 159 | DATA (BCSUN (1)), I=149, 180, / |                 |                 |                 |                 | DATA 148 |
| 160 | 161                             | 3.5972869E-01,  | 3.6299717E-01,  | 3.6616179E-01,  | 3.6922138E-01,  | DATA 149 |
| 161 | 162                             | 3.7217486E-01,  | 3.7502112E-01,  | 3.7775911E-01,  | 3.8038783E-01,  | DATA 150 |
| 162 | 163                             | 3.8290626E-01,  | 3.8531352E-01,  | 3.8760865E-01,  | 3.8979089E-01,  | DATA 151 |
| 163 | 164                             | 3.9185939E-01,  | 3.9381341E-01,  | 3.9565230E-01,  | 3.9737842E-01,  | DATA 152 |
| 164 | 165                             | 3.9982166E-01,  | 4.0147200E-01,  | 4.0318442E-01,  | 4.0485921E-01,  | DATA 153 |
| 165 | 166                             | 4.0423546E-01,  | 4.0525346E-01,  | 4.0615228E-01,  | 4.0693174E-01,  | DATA 154 |
| 166 | 167                             | 4.0759161E-01,  | 4.0813163E-01,  | 4.0855163E-01,  | 4.0885152E-01,  | DATA 155 |
| 167 | 168                             | 4.0903124E-01,  | 4.0909077E-01,  | 4.0903019E-01,  | 4.0884954E-01,  | DATA 156 |
| 168 | 169                             | 4.0854892E-01,  | 4.0812851E-01,  | 4.0758852E-01,  | 4.0692915E-01,  | DATA 157 |
| 169 | DATA (BCSUN (1)), I=181, 216, / |                 |                 |                 |                 | DATA 158 |
| 170 | 171                             | 4.0615072E-01,  | 4.0525353E-01,  | 4.0425778E-01,  | 4.0310448E-01,  | DATA 159 |
| 171 | 172                             | 4.0185356E-01,  | 4.0048567E-01,  | 3.9900145E-01,  | 3.9740147E-01,  | DATA 160 |

|     |                               |                 |                 |                 |                 |          |
|-----|-------------------------------|-----------------|-----------------|-----------------|-----------------|----------|
| 172 | 173                           | 3.9568646E-01,  | 3.9385712E-01,  | 3.9191424E-01,  | 3.8985856E-01,  | DATA 161 |
| 173 | 174                           | 3.9769085E-01,  | 3.8541191E-01,  | 3.8302267E-01,  | 3.8052387E-01,  | DATA 162 |
| 174 | 175                           | 3.7791647E-01,  | 3.7520140E-01,  | 3.7237969E-01,  | 3.6945242E-01,  | DATA 163 |
| 175 | 176                           | 3.6642065E-01,  | 3.6328599E-01,  | 3.6004842E-01,  | 3.5671029E-01,  | DATA 164 |
| 176 | 177                           | 3.5327249E-01,  | 3.4973623E-01,  | 3.4610277E-01,  | 3.4237335E-01,  | DATA 165 |
| 177 | 178                           | 3.3854933E-01,  | 3.3463199E-01,  | 3.3062261E-01,  | 3.2652264E-01,  | DATA 166 |
| 178 | 179                           | 3.2233337E-01,  | 3.1805617E-01,  | 3.1369250E-01,  | 3.0924869E-01,  | DATA 167 |
| 179 | DATA (BCSUN (I), I=217, 252)/ |                 |                 |                 |                 | DATA 168 |
| 180 | 181                           | 3.0471129E-01,  | 3.009665E-01,   | 2.9540124E-01,  | 2.9062642E-01,  | DATA 169 |
| 181 | 182                           | 2.8877370E-01,  | 2.8084440E-01,  | 2.7583990E-01,  | 2.7076136E-01,  | DATA 170 |
| 182 | 183                           | 2.6361069E-01,  | 2.6038878E-01,  | 2.5509730E-01,  | 2.4973773E-01,  | DATA 171 |
| 183 | 184                           | 2.4431159E-01,  | 2.3882042E-01,  | 2.326387E-01,   | 2.2764945E-01,  | DATA 172 |
| 184 | 185                           | 2.2197277E-01,  | 2.1623741E-01,  | 2.1044493E-01,  | 2.0459693E-01,  | DATA 173 |
| 185 | 186                           | 1.9869499E-01,  | 1.9274068E-01,  | 1.8673564E-01,  | 1.8068141E-01,  | DATA 174 |
| 186 | 187                           | 1.7457961E-01,  | 1.6843179E-01,  | 1.6223959E-01,  | 1.5600458E-01,  | DATA 175 |
| 187 | 188                           | 1.4972842E-01,  | 1.4341265E-01,  | 1.3705886E-01,  | 1.3026860E-01,  | DATA 176 |
| 188 | 189                           | 1.2424349E-01,  | 1.1778492E-01,  | 1.1129435E-01,  | 1.0477320E-01,  | DATA 177 |
| 189 | DATA (BCSUN (I), I=253, 288)/ |                 |                 |                 |                 | DATA 178 |
| 190 | 191                           | 9.8222857E-02,  | 9.1644843E-02,  | 8.5040653E-02,  | 7.8411819E-02,  | DATA 179 |
| 191 | 192                           | 7.1759855E-02,  | 6.5086422E-02,  | 5.8393158E-02,  | 5.2681897E-02,  | DATA 180 |
| 192 | 193                           | 4.4953689E-02,  | 3.8210791E-02,  | 3.1454662E-02,  | 2.4686968E-02,  | DATA 181 |
| 193 | 194                           | 1.7909387E-02,  | 1.1123609E-02,  | 4.8313347E-03,  | 2.4657342E-03,  | DATA 182 |
| 194 | 195                           | -9.2659043E-03, | -1.6067451E-02, | -2.2868643E-02, | -2.9667743E-02, | DATA 183 |
| 195 | 196                           | -3.6662982E-02, | -4.3252638E-02, | -5.0034962E-02, | -5.6808219E-02, | DATA 184 |
| 196 | 197                           | -6.3870624E-02, | -7.0320607E-02, | -7.7036548E-02, | -8.3776847E-02, | DATA 185 |
| 197 | 198                           | -9.0479908E-02, | -9.7164092E-02, | -1.0382776E-01, | -1.1046923E-01, | DATA 186 |
| 198 | 199                           | -1.1708684E-01, | -1.2367874E-01, | -1.3024313E-01, | -1.3677817E-01, | DATA 187 |
| 199 | DATA (BCSUN (I), I=289, 324)/ |                 |                 |                 |                 | DATA 188 |
| 200 | 201                           | -1.4328203E-01, | -1.4975265E-01, | -1.5618874E-01, | -1.6258782E-01, | DATA 189 |
| 201 | 202                           | -1.6694819E-01, | -1.7526794E-01, | -1.8194909E-01, | -1.8777773E-01, | DATA 190 |
| 202 | 203                           | -1.9396390E-01, | -2.0010164E-01, | -2.0618893E-01, | -2.122379E-01,  | DATA 191 |
| 203 | 204                           | -2.1820417E-01, | -2.2412810E-01, | -2.2999351E-01, | -2.3579844E-01, | DATA 192 |
| 204 | 205                           | -2.4154081E-01, | -2.4721876E-01, | -2.5283036E-01, | -2.5837382E-01, | DATA 193 |
| 205 | 206                           | -2.6384722E-01, | -2.6924871E-01, | -2.7457647E-01, | -2.7982663E-01, | DATA 194 |
| 206 | 207                           | -2.8500334E-01, | -2.9009866E-01, | -2.9511260E-01, | -3.0004324E-01, | DATA 195 |
| 207 | 208                           | -3.0488867E-01, | -3.0964692E-01, | -3.1431606E-01, | -3.1889416E-01, | DATA 196 |
| 208 | 209                           | -3.2337933E-01, | -3.2776965E-01, | -3.3206319E-01, | -3.3625815E-01, | DATA 197 |
| 209 | DATA (BCSUN (I), I=325, 360)/ |                 |                 |                 |                 | DATA 198 |
| 210 | 211                           | -3.4035264E-01, | -3.4434481E-01, | -3.4823283E-01, | -3.5201487E-01, | DATA 199 |
| 211 | 212                           | -3.5568918E-01, | -3.5925392E-01, | -3.6270739E-01, | -3.6604790E-01, | DATA 200 |
| 212 | 213                           | -3.6927374E-01, | -3.7238339E-01, | -3.7537538E-01, | -3.7824830E-01, | DATA 201 |
| 213 | 214                           | -3.810074E-01,  | -3.8363144E-01, | -3.8613911E-01, | -3.8852260E-01, | DATA 202 |
| 214 | 215                           | -3.9078066E-01, | -3.9291218E-01, | -3.9491601E-01, | -3.9679109E-01, | DATA 203 |
| 215 | 216                           | -3.9853647E-01, | -4.0015114E-01, | -4.0163420E-01, | -4.0298487E-01, | DATA 204 |
| 216 | 217                           | -4.0420233E-01, | -4.0528595E-01, | -4.0623505E-01, | -4.0704911E-01, | DATA 205 |
| 217 | 218                           | -4.072768E-01,  | -4.0827032E-01, | -4.0867669E-01, | -4.0894651E-01, | DATA 206 |
| 218 | 219                           | -4.0907961E-01, | -4.0907574E-01, | -4.0893485E-01, | -4.0865689E-01, | DATA 207 |
| 219 | DATA (BCSUN (I), I=361, 368)/ |                 |                 |                 |                 | DATA 208 |
| 220 | 221                           | -4.0824195E-01, | -4.0769013E-01, | -4.0700176E-01, | -4.0617713E-01, | DATA 209 |
| 221 | 222                           | -4.0521666E-01, | -4.0412086E-01, | -4.0289032E-01, | -4.0152563E-01, | DATA 210 |
| 222 | DATA (RSUN (I), I=1, 36)/     |                 |                 |                 |                 | DATA 210 |
| 223 | 231                           | 9.8400398E-01,  | 9.8398503E-01,  | 9.8396990E-01,  | 9.8395886E-01,  | DATA 211 |
| 224 | 232                           | 9.8395209E-01,  | 9.8394992E-01,  | 9.8395269E-01,  | 9.8396070E-01,  | DATA 212 |
| 225 | 233                           | 9.8397440E-01,  | 9.8399385E-01,  | 9.8401924E-01,  | 9.8405075E-01,  | DATA 213 |
| 226 | 234                           | 9.8408852E-01,  | 9.8413255E-01,  | 9.8418286E-01,  | 9.8423941E-01,  | DATA 214 |
| 227 | 235                           | 9.8430218E-01,  | 9.8437101E-01,  | 9.8444577E-01,  | 9.8452626E-01,  | DATA 215 |
| 228 | 236                           | 9.8461238E-01,  | 9.8470375E-01,  | 9.8480010E-01,  | 9.8490112E-01,  | DATA 216 |
| 229 | 237                           | 9.8500659E-01,  | 9.8511608E-01,  | 9.8522929E-01,  | 9.8534593E-01,  | DATA 217 |
| 230 | 238                           | 9.8546550E-01,  | 9.8558822E-01,  | 9.8571408E-01,  | 9.8584314E-01,  | DATA 218 |
| 231 | 239                           | 9.8597535E-01,  | 9.8611110E-01,  | 9.8625062E-01,  | 9.8639418E-01,  | DATA 219 |
| 232 | DATA (RSUN (I), I=37, 72)/    |                 |                 |                 |                 | DATA 220 |
| 233 | 241                           | 9.8654219E-01,  | 9.8669472E-01,  | 9.8685195E-01,  | 9.8701406E-01,  | DATA 221 |
| 234 | 242                           | 9.8718125E-01,  | 9.8735351E-01,  | 9.8753092E-01,  | 9.8771347E-01,  | DATA 222 |
| 235 | 243                           | 9.8790120E-01,  | 9.8809395E-01,  | 9.8829164E-01,  | 9.8849413E-01,  | DATA 223 |
| 236 | 244                           | 9.8870128E-01,  | 9.8891276E-01,  | 9.8912829E-01,  | 9.8934756E-01,  | DATA 224 |
| 237 | 245                           | 9.8957034E-01,  | 9.8979612E-01,  | 9.9002451E-01,  | 9.9025512E-01,  | DATA 225 |
| 238 | 246                           | 9.9048745E-01,  | 9.9072144E-01,  | 9.9095695E-01,  | 9.9119384E-01,  | DATA 226 |
| 239 | 247                           | 9.9143185E-01,  | 9.9167131E-01,  | 9.9191238E-01,  | 9.9215528E-01,  | DATA 227 |
| 240 | 248                           | 9.9240027E-01,  | 9.9264749E-01,  | 9.9289710E-01,  | 9.9314929E-01,  | DATA 228 |
| 241 | 249                           | 9.9340428E-01,  | 9.9366210E-01,  | 9.9392287E-01,  | 9.9418664E-01,  | DATA 229 |
| 242 | DATA (RSUN (I), I=73, 108)/   |                 |                 |                 |                 | DATA 230 |
| 243 | 251                           | 9.9445347E-01,  | 9.9472328E-01,  | 9.9499605E-01,  | 9.9527167E-01,  | DATA 231 |
| 244 | 252                           | 9.9550098E-01,  | 9.9583102E-01,  | 9.9611419E-01,  | 9.9639934E-01,  | DATA 232 |



|     |                             |                |                |                |                |          |
|-----|-----------------------------|----------------|----------------|----------------|----------------|----------|
| 245 | 253                         | 9.9668623E-01, | 9.9697436E-01, | 9.9726331E-01, | 9.9755265E-01, | DATA 233 |
| 246 | 254                         | 9.9784193E-01, | 9.9813089E-01, | 9.9841925E-01, | 9.9870677E-01, | DATA 234 |
| 247 | 255                         | 9.9899302E-01, | 9.9927825E-01, | 9.9956251E-01, | 9.9984592E-01, | DATA 235 |
| 248 | 256                         | 1.0001284E 00, | 1.0004107E 00, | 1.0006924E 00, | 1.0009739E 00, | DATA 236 |
| 249 | 257                         | 1.0012555E 00, | 1.0015371E 00, | 1.0018189E 00, | 1.0021012E 00, | DATA 237 |
| 250 | 258                         | 1.0023838E 00, | 1.0026670E 00, | 1.0029507E 00, | 1.0032350E 00, | DATA 238 |
| 251 | 259                         | 1.0035198E 00, | 1.0038049E 00, | 1.0040902E 00, | 1.0043754E 00, | DATA 239 |
| 252 | DATA (RSUN (1)) I=109,1441/ |                |                |                |                | DATA 240 |
| 253 | 261                         | 1.0046605E 00, | 1.0049448E 00, | 1.0052280E 00, | 1.0055096E 00, | DATA 241 |
| 254 | 262                         | 1.0057893E 00, | 1.0060668E 00, | 1.0063416E 00, | 1.0066134E 00, | DATA 242 |
| 255 | 263                         | 1.0068818E 00, | 1.0071470E 00, | 1.0074088E 00, | 1.0076672E 00, | DATA 243 |
| 256 | 264                         | 1.0079223E 00, | 1.0081742E 00, | 1.0084231E 00, | 1.0086691E 00, | DATA 244 |
| 257 | 265                         | 1.0089125E 00, | 1.0091534E 00, | 1.0093919E 00, | 1.0096282E 00, | DATA 245 |
| 258 | 266                         | 1.0098625E 00, | 1.0100950E 00, | 1.0103256E 00, | 1.0105546E 00, | DATA 246 |
| 259 | 267                         | 1.0107822E 00, | 1.0110080E 00, | 1.0112322E 00, | 1.0114544E 00, | DATA 247 |
| 260 | 268                         | 1.0116749E 00, | 1.0118930E 00, | 1.0121085E 00, | 1.0123209E 00, | DATA 248 |
| 261 | 269                         | 1.0125299E 00, | 1.0127351E 00, | 1.0129362E 00, | 1.0131328E 00, | DATA 249 |
| 262 | DATA (RSUN (1)) I=145,1801/ |                |                |                |                | DATA 250 |
| 263 | 271                         | 1.0133244E 00, | 1.0135111E 00, | 1.0136928E 00, | 1.0138693E 00, | DATA 251 |
| 264 | 272                         | 1.0140406E 00, | 1.0142068E 00, | 1.0143680E 00, | 1.0145243E 00, | DATA 252 |
| 265 | 273                         | 1.0146760E 00, | 1.0148232E 00, | 1.0149660E 00, | 1.0151047E 00, | DATA 253 |
| 266 | 274                         | 1.0152395E 00, | 1.0153705E 00, | 1.0154981E 00, | 1.0156224E 00, | DATA 254 |
| 267 | 275                         | 1.0157436E 00, | 1.0158617E 00, | 1.0159769E 00, | 1.0160891E 00, | DATA 255 |
| 268 | 276                         | 1.0161984E 00, | 1.0163046E 00, | 1.0164072E 00, | 1.0165060E 00, | DATA 256 |
| 269 | 277                         | 1.0166007E 00, | 1.0166909E 00, | 1.0167763E 00, | 1.0168565E 00, | DATA 257 |
| 270 | 278                         | 1.0169311E 00, | 1.0170001E 00, | 1.0170632E 00, | 1.0171204E 00, | DATA 258 |
| 271 | 279                         | 1.0171715E 00, | 1.0172166E 00, | 1.0172557E 00, | 1.0172890E 00, | DATA 259 |
| 272 | DATA (RSUN (1)) I=181,2161/ |                |                |                |                | DATA 260 |
| 273 | 281                         | 1.0173165E 00, | 1.0173384E 00, | 1.0173550E 00, | 1.0173665E 00, | DATA 261 |
| 274 | 282                         | 1.0173729E 00, | 1.0173746E 00, | 1.0173719E 00, | 1.0173651E 00, | DATA 262 |
| 275 | 283                         | 1.0173545E 00, | 1.0173401E 00, | 1.0173223E 00, | 1.0173012E 00, | DATA 263 |
| 276 | 284                         | 1.0172770E 00, | 1.0172496E 00, | 1.0172187E 00, | 1.0171842E 00, | DATA 264 |
| 277 | 285                         | 1.0171456E 00, | 1.0171032E 00, | 1.0170560E 00, | 1.0170041E 00, | DATA 265 |
| 278 | 286                         | 1.0169469E 00, | 1.0168843E 00, | 1.0168162E 00, | 1.0167424E 00, | DATA 266 |
| 279 | 287                         | 1.0166627E 00, | 1.0165772E 00, | 1.0164859E 00, | 1.0163889E 00, | DATA 267 |
| 280 | 288                         | 1.0162861E 00, | 1.0161778E 00, | 1.0160642E 00, | 1.0159454E 00, | DATA 268 |
| 281 | 289                         | 1.0158215E 00, | 1.0156930E 00, | 1.0155602E 00, | 1.0154233E 00, | DATA 269 |
| 282 | DATA (RSUN (1)) I=217,2521/ |                |                |                |                | DATA 270 |
| 283 | 291                         | 1.0152825E 00, | 1.0151384E 00, | 1.0149911E 00, | 1.0148410E 00, | DATA 271 |
| 284 | 292                         | 1.0146886E 00, | 1.0145336E 00, | 1.0143760E 00, | 1.0142158E 00, | DATA 272 |
| 285 | 293                         | 1.0140531E 00, | 1.0138873E 00, | 1.0137184E 00, | 1.0135459E 00, | DATA 273 |
| 286 | 294                         | 1.0133695E 00, | 1.0131891E 00, | 1.0130045E 00, | 1.0128155E 00, | DATA 274 |
| 287 | 295                         | 1.0126219E 00, | 1.0124238E 00, | 1.0122211E 00, | 1.0120138E 00, | DATA 275 |
| 288 | 296                         | 1.0118018E 00, | 1.0115855E 00, | 1.0113648E 00, | 1.0111400E 00, | DATA 276 |
| 289 | 297                         | 1.0109111E 00, | 1.0106786E 00, | 1.0104426E 00, | 1.0102036E 00, | DATA 277 |
| 290 | 298                         | 1.0099618E 00, | 1.0097176E 00, | 1.0094714E 00, | 1.0092236E 00, | DATA 278 |
| 291 | 299                         | 1.0089747E 00, | 1.0087248E 00, | 1.0084739E 00, | 1.0082222E 00, | DATA 279 |
| 292 | DATA (RSUN (1)) I=253,2881/ |                |                |                |                | DATA 280 |
| 293 | 301                         | 1.0079699E 00, | 1.0077167E 00, | 1.0074623E 00, | 1.0072065E 00, | DATA 281 |
| 294 | 302                         | 1.0069491E 00, | 1.0066899E 00, | 1.0064286E 00, | 1.0061652E 00, | DATA 282 |
| 295 | 303                         | 1.0058994E 00, | 1.0056312E 00, | 1.0053604E 00, | 1.0050871E 00, | DATA 283 |
| 296 | 304                         | 1.0048112E 00, | 1.0045328E 00, | 1.0042519E 00, | 1.0039688E 00, | DATA 284 |
| 297 | 305                         | 1.0036834E 00, | 1.0033961E 00, | 1.0031071E 00, | 1.0028167E 00, | DATA 285 |
| 298 | 306                         | 1.0025251E 00, | 1.0022329E 00, | 1.0019406E 00, | 1.0016481E 00, | DATA 286 |
| 299 | 307                         | 1.0013564E 00, | 1.0010656E 00, | 1.0007759E 00, | 1.0004876E 00, | DATA 287 |
| 300 | 308                         | 1.0002010E 00, | 9.9991594E-01, | 9.9983227E-01, | 9.9974985E-01, | DATA 288 |
| 301 | 309                         | 9.9906851E-01, | 9.9878811E-01, | 9.9850844E-01, | 9.9822932E-01, | DATA 289 |
| 302 | DATA (RSUN (1)) I=289,3241/ |                |                |                |                | DATA 290 |
| 303 | 311                         | 9.9795052E-01, | 9.9767193E-01, | 9.9739347E-01, | 9.9711503E-01, | DATA 291 |
| 304 | 312                         | 9.9683653E-01, | 9.9655795E-01, | 9.9627931E-01, | 9.9600065E-01, | DATA 292 |
| 305 | 313                         | 9.9572194E-01, | 9.9544346E-01, | 9.9516336E-01, | 9.9488193E-01, | DATA 293 |
| 306 | 314                         | 9.9461126E-01, | 9.9433588E-01, | 9.9406220E-01, | 9.9379059E-01, | DATA 294 |
| 307 | 315                         | 9.9352148E-01, | 9.9325521E-01, | 9.9299215E-01, | 9.9273258E-01, | DATA 295 |
| 308 | 316                         | 9.9247701E-01, | 9.9222528E-01, | 9.9197740E-01, | 9.9173338E-01, | DATA 296 |
| 309 | 317                         | 9.9149311E-01, | 9.9125644E-01, | 9.9102333E-01, | 9.9079344E-01, | DATA 297 |
| 310 | 318                         | 9.9056658E-01, | 9.9034265E-01, | 9.9012147E-01, | 9.8990290E-01, | DATA 298 |
| 311 | 319                         | 9.8968679E-01, | 9.8947304E-01, | 9.8926157E-01, | 9.8905227E-01, | DATA 299 |
| 312 | DATA (RSUN (1)) I=325,3601/ |                |                |                |                | DATA 300 |
| 313 | 321                         | 9.8884508E-01, | 9.8864011E-01, | 9.8843747E-01, | 9.8823730E-01, | DATA 301 |
| 314 | 322                         | 9.8803961E-01, | 9.8784488E-01, | 9.8765334E-01, | 9.8746563E-01, | DATA 302 |
| 315 | 323                         | 9.8728182E-01, | 9.8710240E-01, | 9.8692772E-01, | 9.8675813E-01, | DATA 303 |
| 316 | 324                         | 9.8659410E-01, | 9.8643562E-01, | 9.8628279E-01, | 9.8613566E-01, | DATA 304 |
| 317 | 325                         | 9.8599435E-01, | 9.8585866E-01, | 9.8572849E-01, | 9.8560365E-01, | DATA 305 |

|     |     |                              |                |                |                |          |   |
|-----|-----|------------------------------|----------------|----------------|----------------|----------|---|
| 818 | 326 | 9.8848395E-01,               | 9.8536924E-01, | 9.8525930E-01, | 9.8518897E-01, | DATA 306 |   |
| 819 | 327 | 9.8805305E-01,               | 9.8495632E-01, | 9.8486358E-01, | 9.8477464E-01, | DATA 307 |   |
| 820 | 328 | 9.8468936E-01,               | 9.8460766E-01, | 9.8452930E-01, | 9.8445488E-01, | DATA 308 |   |
| 821 | 329 | 9.8438366E-01,               | 9.8431624E-01, | 9.8425286E-01, | 9.8417380E-01, | DATA 309 |   |
| 822 |     | DATA (RSUN (1),1)=361.3631/  |                |                |                | DATA 310 | 6 |
| 823 | 331 | 9.8413931E-01,               | 9.8405979E-01, | 9.8404557E-01, | 9.8400696E-01, | DATA 311 |   |
| 824 | 332 | 9.8397442E-01,               | 9.8394801E-01, | 9.8392787E-01, | 9.8391420E-01, | DATA 312 |   |
| 825 |     | DATA (RAMOON(1),1)=1.361/    |                |                |                | DATA 312 | 6 |
| 826 | 341 | 5.1807938E 00,               | 5.4506232E 00, | 5.7102290E 00, | 5.9582956E 00, | DATA 313 |   |
| 827 | 342 | 6.1958342E 00,               | 1.4202633E-01, | 3.8608036E-01, | 5.8749249E-01, | DATA 314 |   |
| 828 | 343 | 8.0837272E-01,               | 1.0299945E 00, | 1.2526584E 00, | 1.4757241E 00, | DATA 315 |   |
| 829 | 344 | 1.6978491E 00,               | 1.9174081E 00, | 2.1325802E 00, | 2.3437521E 00, | DATA 316 |   |
| 830 | 345 | 2.5497366E 00,               | 2.7518034E 00, | 2.9515833E 00, | 3.1513374E 00, | DATA 317 |   |
| 831 | 346 | 3.3937896E 00,               | 3.5619878E 00, | 3.7790711E 00, | 4.0078938E 00, | DATA 318 |   |
| 832 | 347 | 4.2804201E 00,               | 4.5068691E 00, | 4.7749763E 00, | 5.0499093E 00, | DATA 319 |   |
| 833 | 348 | 5.3253641E 00,               | 5.5934819E 00, | 5.8564739E 00, | 6.1071175E 00, | DATA 320 |   |
| 834 | 349 | 6.5060571E-02,               | 2.986554E-01,  | 5.2709053E-01, | 7.5246837E-01, | DATA 321 |   |
| 835 |     | DATA (RAMOON(1),1)=37.7921/  |                |                |                | DATA 322 | 6 |
| 836 | 351 | 9.7434204E-01,               | 1.1995413E 00, | 1.4220946E 00, | 1.6433849E 00, | DATA 323 |   |
| 837 | 352 | 1.8624118E 00,               | 2.0781426E 00, | 2.2898502E 00, | 2.4973541E 00, | DATA 324 |   |
| 838 | 353 | 2.7011265E 00,               | 2.9022816E 00, | 3.1024965E 00, | 3.3039001E 00, | DATA 325 |   |
| 839 | 354 | 3.5089470E 00,               | 3.7202557E 00, | 3.9403669E 00, | 4.1713842E 00, | DATA 326 |   |
| 840 | 355 | 4.4143378E 00,               | 4.6687865E 00, | 4.9322329E 00, | 5.2005823E 00, | DATA 327 |   |
| 841 | 356 | 5.4689384E 00,               | 5.7331555E 00, | 5.9907022E 00, | 6.2408615E 00, | DATA 328 |   |
| 842 | 357 | 2.0109741E-01,               | 4.3912188E-01, | 6.8318162E-01, | 9.8438677E-01, | DATA 329 |   |
| 843 | 358 | 1.1333141E 00,               | 1.3997666E 00, | 1.6837441E 00, | 1.9045707E 00, | DATA 330 |   |
| 844 | 359 | 2.0312613E 00,               | 2.2337071E 00, | 2.4042038E 00, | 2.6468870E 00, | DATA 331 |   |
| 845 |     | DATA (RAMOON(1),1)=73.1081/  |                |                |                | DATA 332 | 6 |
| 846 | 361 | 2.8493624E 00,               | 3.0509910E 00, | 3.2530227E 00, | 3.4593209E 00, | DATA 333 |   |
| 847 | 362 | 3.6702216E 00,               | 3.8883320E 00, | 4.1152450E 00, | 4.3517717E 00, | DATA 334 |   |
| 848 | 363 | 4.5975691E 00,               | 4.8509415E 00, | 5.1090229E 00, | 5.3684143E 00, | DATA 335 |   |
| 849 | 364 | 5.6260564E 00,               | 5.8799315E 00, | 6.1293027E 00, | 6.3833796E-02, | DATA 336 |   |
| 850 | 365 | 3.3319547E-01,               | 5.7272951E-01, | 8.1047689E-01, | 1.0464197E 00, | DATA 337 |   |
| 851 | 366 | 1.2799502E 00,               | 1.5100739E 00, | 1.7357371E 00, | 1.9561621E 00, | DATA 338 |   |
| 852 | 367 | 2.1710873E 00,               | 2.3808663E 00, | 2.5864437E 00, | 2.7892603E 00, | DATA 339 |   |
| 853 | 368 | 2.9911319E 00,               | 3.1941253E 00, | 3.4004287E 00, | 3.6121933E 00, | DATA 340 |   |
| 854 | 369 | 3.8313125E 00,               | 4.0591190E 00, | 4.2960240E 00, | 4.5412070E 00, | DATA 341 |   |
| 855 |     | DATA (RAMOON(1),1)=109.1441/ |                |                |                | DATA 342 | 6 |
| 856 | 371 | 4.7825501E 00,               | 5.0469922E 00, | 5.3012730E 00, | 5.5527790E 00, | DATA 343 |   |
| 857 | 372 | 5.8001086E 00,               | 6.0431698E 00, | 6.2828808E 00, | 6.5274820E-01, | DATA 344 |   |
| 858 | 373 | 4.7673807E-01,               | 7.1233389E-01, | 9.3039020E-01, | 1.1879820E 00, | DATA 345 |   |
| 859 | 374 | 1.4235301E 00,               | 1.6551460E 00, | 1.8811948E 00, | 2.1007332E 00, | DATA 346 |   |
| 860 | 375 | 2.3137187E 00,               | 2.5231206E 00, | 2.7241138E 00, | 2.9251826E 00, | DATA 347 |   |
| 861 | 376 | 3.1266373E 00,               | 3.3311002E 00, | 3.5411983E 00, | 3.7593194E 00, | DATA 348 |   |
| 862 | 377 | 3.9872526E 00,               | 4.2257126E 00, | 4.4738680E 00, | 4.7291468E 00, | DATA 349 |   |
| 863 | 378 | 4.9876242E 00,               | 5.2450206E 00, | 5.4978935E 00, | 5.7444343E 00, | DATA 350 |   |
| 864 | 379 | 5.9845939E 00,               | 6.246833E 00,  | 6.5057206E-01, | 6.7681321E-01, | DATA 351 |   |
| 865 |     | DATA (RAMOON(1),1)=145.1801/ |                |                |                | DATA 352 | 6 |
| 866 | 381 | 6.3399434E-01,               | 8.6604548E-01, | 1.1017787E 00, | 1.3378717E 00, | DATA 353 |   |
| 867 | 382 | 1.5721861E 00,               | 1.8023668E 00, | 2.0265079E 00, | 2.2436337E 00, | DATA 354 |   |
| 868 | 383 | 2.4838717E 00,               | 2.6583625E 00, | 2.8390415E 00, | 3.0284045E 00, | DATA 355 |   |
| 869 | 384 | 3.2893091E 00,               | 3.4647964E 00, | 3.6778784E 00, | 3.9012100E 00, | DATA 356 |   |
| 870 | 385 | 4.1365780E 00,               | 4.3842301E 00, | 4.6422849E 00, | 4.9066835E 00, | DATA 357 |   |
| 871 | 386 | 5.1720608E 00,               | 5.4333143E 00, | 5.6870378E 00, | 5.9321029E 00, | DATA 358 |   |
| 872 | 387 | 6.1693646E 00,               | 1.1774393E-01, | 3.4620604E-01, | 5.7401641E-01, | DATA 359 |   |
| 873 | 388 | 8.0299043E-01,               | 1.0339431E 00, | 1.2664978E 00, | 1.4991634E 00, | DATA 360 |   |
| 874 | 389 | 1.7297335E 00,               | 1.9559201E 00, | 2.1759938E 00, | 2.3892044E 00, | DATA 361 |   |
| 875 |     | DATA (RAMOON(1),1)=304.2131/ |                |                |                | DATA 362 | 6 |
| 876 | 391 | 2.5958970E 00,               | 2.7973962E 00, | 2.9957298E 00, | 3.1937145E 00, | DATA 363 |   |
| 877 | 392 | 3.3941734E 00,               | 3.6003659E 00, | 3.8154606E 00, | 4.0422039E 00, | DATA 364 |   |
| 878 | 393 | 4.2823201E 00,               | 4.5357234E 00, | 4.7998983E 00, | 5.0609493E 00, | DATA 365 |   |
| 879 | 394 | 5.3399388E 00,               | 5.6044025E 00, | 5.8602833E 00, | 6.1068821E 00, | DATA 366 |   |
| 880 | 395 | 6.2053240E-02,               | 2.9463005E-01, | 5.2392040E-01, | 7.5214984E-01, | DATA 367 |   |
| 881 | 396 | 9.8079624E-03,               | 1.2103320E 00, | 1.4401656E 00, | 1.6688362E 00, | DATA 368 |   |
| 882 | 397 | 1.8944519E 00,               | 2.1152469E 00, | 2.3300685E 00, | 2.5388511E 00, | DATA 369 |   |
| 883 | 398 | 2.7416537E 00,               | 2.9405531E 00, | 3.1374491E 00, | 3.3349186E 00, | DATA 370 |   |
| 884 | 399 | 3.5358472E 00,               | 3.7432895E 00, | 3.9602074E 00, | 4.1890775E 00, | DATA 371 |   |
| 885 |     | DATA (RAMOON(1),1)=217.2521/ |                |                |                | DATA 372 | 6 |
| 886 | 401 | 4.4312761E 00,               | 4.6863528E 00, | 4.9515420E 00, | 5.2220402E 00, | DATA 373 |   |
| 887 | 402 | 5.4922424E 00,               | 5.7574242E 00, | 6.0148947E 00, | 6.2641667E 00, | DATA 374 |   |
| 888 | 403 | 2.2816161E-01,               | 4.6014927E-01, | 6.9390685E-01, | 9.2595055E-01, | DATA 375 |   |
| 889 | 404 | 1.1970541E 00,               | 1.3871077E 00, | 1.6133075E 00, | 1.8403753E 00, | DATA 376 |   |
| 890 | 405 | 2.0610084E 00,               | 2.2762637E 00, | 2.4858214E 00, | 2.6900618E 00, | DATA 377 |   |



|     |                                |                 |                 |                 |                 |          |
|-----|--------------------------------|-----------------|-----------------|-----------------|-----------------|----------|
| 891 | 406                            | 2.8901245E 00,  | 3.1879937E 00,  | 3.2848786E 00,  | 3.6634694E 00,  | DATA 378 |
| 892 | 407                            | 3.6868901E 00,  | 3.8973228E 00,  | 4.3172925E 00,  | 4.3483750E 00,  | DATA 379 |
| 893 | 408                            | 4.5912883E 00,  | 4.8449572E 00,  | 5.3068999E 00,  | 5.3721516E 00,  | DATA 380 |
| 894 | 409                            | 5.4873542E 00,  | 5.8989114E 00,  | 6.1551302E 00,  | 1.2267050E-01,  | DATA 381 |
| 895 | DATA (BACHORN1), 1, 253.12881/ |                 |                 |                 |                 | DATA 382 |
| 896 | 411                            | 3.6674379E-01,  | 6.1133459E-01,  | 8.5138616E-01,  | 1.0892717E 00,  | DATA 383 |
| 897 | 412                            | 1.3846936E 00,  | 1.5968107E 00,  | 1.7848334E 00,  | 2.0068794E 00,  | DATA 384 |
| 898 | 413                            | 2.2832761E 00,  | 2.4337286E 00,  | 2.6388907E 00,  | 2.8398033E 00,  | DATA 385 |
| 899 | 414                            | 3.0881783E 00,  | 3.2358834E 00,  | 3.4330315E 00,  | 3.6378270E 00,  | DATA 386 |
| 900 | 415                            | 3.8864284E 00,  | 4.0627388E 00,  | 4.2881499E 00,  | 4.5231873E 00,  | DATA 387 |
| 901 | 416                            | 4.7872335E 00,  | 5.0184492E 00,  | 5.2740812E 00,  | 5.5311347E 00,  | DATA 388 |
| 902 | 417                            | 5.7871539E 00,  | 6.0407472E 00,  | 6.4733471E-03,  | 2.5724734E-01,  | DATA 389 |
| 903 | 418                            | 5.0869357E-01,  | 7.5128696E-01,  | 9.9687757E-01,  | 1.2464736E 00,  | DATA 390 |
| 904 | 419                            | 1.4804903E 00,  | 1.7151792E 00,  | 1.9431261E 00,  | 2.1636159E 00,  | DATA 391 |
| 905 | DATA (BACHORN1), 1, 289.3241/  |                 |                 |                 |                 | DATA 392 |
| 906 | 421                            | 2.3767713E 00,  | 2.5834906E 00,  | 2.7852789E 00,  | 2.9840888E 00,  | DATA 393 |
| 907 | 422                            | 3.1822380E 00,  | 3.3814073E 00,  | 3.5848394E 00,  | 3.7935027E 00,  | DATA 394 |
| 908 | 423                            | 4.0100129E 00,  | 4.2351226E 00,  | 4.4689278E 00,  | 4.7103767E 00,  | DATA 395 |
| 909 | 424                            | 4.9873495E 00,  | 5.2071030E 00,  | 5.4569825E 00,  | 5.7051133E 00,  | DATA 396 |
| 910 | 425                            | 5.9897848E 00,  | 6.1944208E 00,  | 1.9403787E-01,  | 3.9744713E-01,  | DATA 397 |
| 911 | 426                            | 6.4254946E-01,  | 8.8954911E-01,  | 1.3374557E 00,  | 1.3841496E 00,  | DATA 398 |
| 912 | 427                            | 1.6268822E 00,  | 1.8630431E 00,  | 2.0908608E 00,  | 2.3097655E 00,  | DATA 399 |
| 913 | 428                            | 2.5203781E 00,  | 2.7242536E 00,  | 2.9235939E 00,  | 3.1209643E 00,  | DATA 400 |
| 914 | 429                            | 3.3191051E 00,  | 3.5207677E 00,  | 3.7289351E 00,  | 3.9445713E 00,  | DATA 401 |
| 915 | DATA (BACHORN1), 1, 325.3601/  |                 |                 |                 |                 | DATA 402 |
| 916 | 431                            | 4.1702678E 00,  | 4.4058268E 00,  | 4.6499459E 00,  | 4.8998845E 00,  | DATA 403 |
| 917 | 432                            | 5.1818947E 00,  | 5.4025143E 00,  | 5.6492357E 00,  | 5.8911681E 00,  | DATA 404 |
| 918 | 433                            | 6.1289594E 00,  | 6.3151106E-02,  | 3.1633385E-01,  | 5.9352309E-01,  | DATA 405 |
| 919 | 434                            | 7.9402141E-01,  | 1.0380169E 00,  | 1.2841619E 00,  | 1.5287730E 00,  | DATA 406 |
| 920 | 435                            | 1.7115084E 00,  | 2.0063215E 00,  | 2.3322659E 00,  | 2.6488472E 00,  | DATA 407 |
| 921 | 436                            | 2.6869268E 00,  | 2.8584012E 00,  | 3.058232E 00,   | 3.2521384E 00,  | DATA 408 |
| 922 | 437                            | 3.4804723E 00,  | 3.6539565E 00,  | 3.8659052E 00,  | 4.0874643E 00,  | DATA 409 |
| 923 | 438                            | 4.3211004E 00,  | 4.5660167E 00,  | 4.8197923E 00,  | 5.0782503E 00,  | DATA 410 |
| 924 | 439                            | 5.3368168E 00,  | 5.5904705E 00,  | 5.8377517E 00,  | 6.0782424E 00,  | DATA 411 |
| 925 | DATA (BACHORN1), 1, 361.3681/  |                 |                 |                 |                 | DATA 412 |
| 926 | 441                            | 3.0058995E-02,  | 2.6189860E-01,  | 4.9352154E-01,  | 7.2690693E-01,  | DATA 413 |
| 927 | 442                            | 9.6852225E-01,  | 1.2034019E 00,  | 1.4450900E 00,  | 1.6859133E 00,  | DATA 414 |
| 928 | DATA (BACHORN1), 1, 36.1/      |                 |                 |                 |                 | DATA 415 |
| 929 | 451                            | -2.9625164E-01, | -2.5228647E-01, | -1.9211900E-01, | -1.2128985E-01, | DATA 416 |
| 930 | 452                            | -4.5885466E-02, | 3.1049247E-02,  | 1.8373965E-01,  | 1.8997125E-01,  | DATA 417 |
| 931 | 453                            | 2.2893052E-01,  | 2.7069144E-01,  | 3.0220526E-01,  | 3.1937404E-01,  | DATA 418 |
| 932 | 454                            | 3.2175890E-01,  | 3.0964386E-01,  | 2.8400255E-01,  | 2.4636243E-01,  | DATA 419 |
| 933 | 455                            | 1.9861167E-01,  | 1.4281362E-01,  | 8.1082779E-02,  | 1.5548462E-02,  | DATA 420 |
| 934 | 456                            | -5.1890707E-02, | -1.1793358E-01, | -1.8069269E-01, | -2.3651049E-01, | DATA 421 |
| 935 | 457                            | -2.8144165E-01, | -3.1110537E-01, | -8.2144373E-01, | -8.8977373E-01, | DATA 422 |
| 936 | 458                            | -2.7886970E-01, | -2.2237967E-01, | -1.5426436E-01, | -7.7592395E-02, | DATA 423 |
| 937 | 459                            | 1.6867940E-03,  | 7.8346573E-02,  | 1.4843708E-01,  | 2.8891445E-01,  | DATA 424 |
| 938 | DATA (BACHORN1), 1, 37.721/    |                 |                 |                 |                 | DATA 425 |
| 939 | 461                            | 2.8760080E-01,  | 2.9298460E-01,  | 3.1412867E-01,  | 3.2065063E-01,  | DATA 426 |
| 940 | 462                            | 3.1873436E-01,  | 2.9112511E-01,  | 2.5707993E-01,  | 2.1227805E-01,  | DATA 427 |
| 941 | 463                            | 1.5867232E-01,  | 9.8439974E-02,  | 3.8847450E-02,  | 8.2743645E-02,  | DATA 428 |
| 942 | 464                            | -8.8852675E-02, | -1.6180402E-01, | -8.3863061E-01, | -8.6611156E-01, | DATA 429 |
| 943 | 465                            | -3.0033538E-01, | -3.1300390E-01, | -8.1604616E-01, | -2.9294630E-01, | DATA 430 |
| 944 | 466                            | -2.4936411E-01, | -1.8039400E-01, | -1.1491178E-01, | -8.9049325E-02, | DATA 431 |
| 945 | 467                            | 4.7832472E-02,  | 1.2065925E-01,  | 1.8710051E-01,  | 2.4160984E-01,  | DATA 432 |
| 946 | 468                            | 2.8230771E-01,  | 3.0820328E-01,  | 3.1902851E-01,  | 3.1510420E-01,  | DATA 433 |
| 947 | 469                            | 2.9723510E-01,  | 2.6661889E-01,  | 2.8077303E-01,  | 1.7347771E-01,  | DATA 434 |
| 948 | DATA (BACHORN1), 1, 73.1061/   |                 |                 |                 |                 | DATA 435 |
| 949 | 471                            | 1.1473874E-01,  | 9.8768768E-02,  | 1.8016806E-02,  | 8.2993907E-02,  | DATA 436 |
| 950 | 472                            | -1.4732021E-01, | -2.8593471E-01, | -8.9559182E-01, | -8.9287302E-01, | DATA 437 |
| 951 | 473                            | -3.1492612E-01, | -3.1885917E-01, | -8.0324164E-01, | -2.8867335E-01, | DATA 438 |
| 952 | 474                            | -2.1814039E-01, | -1.4794202E-01, | -9.1298955E-02, | -9.2493615E-03, | DATA 439 |
| 953 | 475                            | 8.8113694E-02,  | 1.6025243E-01,  | 2.2159898E-01,  | 2.6927841E-01,  | DATA 440 |
| 954 | 476                            | 3.0161847E-01,  | 3.1809418E-01,  | 3.1888809E-01,  | 3.8506670E-01,  | DATA 441 |
| 955 | 477                            | 2.7794072E-01,  | 2.3951399E-01,  | 1.9032597E-01,  | 1.8343821E-01,  | DATA 442 |
| 956 | 478                            | 7.0467019E-02,  | 3.4831419E-03,  | 8.4461713E-02,  | -1.8098868E-01, | DATA 443 |
| 957 | 479                            | -1.9269162E-01, | -2.4995512E-01, | -8.8731682E-01, | -8.1345201E-01, | DATA 444 |
| 958 | DATA (BACHORN1), 1, 189.1441/  |                 |                 |                 |                 | DATA 445 |
| 959 | 481                            | -3.2181316E-01, | -8.1103160E-01, | -8.8120998E-01, | -2.5396728E-01, | DATA 446 |
| 960 | 482                            | -1.7222803E-01, | -1.0002947E-01, | -8.8103326E-02, | 7.7129927E-02,  | DATA 447 |
| 961 | 483                            | 1.3219847E-01,  | 1.9890976E-01,  | 2.9323477E-01,  | 2.9284747E-01,  | DATA 448 |
| 962 | 484                            | 3.1623302E-01,  | 3.2317290E-01,  | 3.2443109E-01,  | 2.9144151E-01,  | DATA 449 |
| 963 | 485                            | 2.5899100E-01,  | 2.1000074E-01,  | 1.5538134E-01,  | 9.4062372E-02,  | DATA 450 |

|     |                               |                |                |                |                |          |
|-----|-------------------------------|----------------|----------------|----------------|----------------|----------|
| 664 | 486                           | 2.8064217E-02, | 4.0359473E-02, | 1.0857023E-01, | 1.7343173E-01, | DATA 480 |
| 665 | 487                           | 2.3130260E-01, | 2.7821347E-01, | 3.3028460E-01, | 3.2439197E-01, | DATA 481 |
| 666 | 488                           | 3.1862571E-01, | 2.9310602E-01, | 2.4956991E-01, | 1.9115801E-01, | DATA 482 |
| 667 | 489                           | 1.2184366E-01, | 4.5998579E-02, | 3.3932601E-02, | 1.8757104E-01, | DATA 483 |
| 668 | DATA (BCHMOON1), I:145,180, / |                |                |                |                | DATA 484 |
| 669 | 491                           | 1.7674957E-01, | 2.3570362E-01, | 2.8133200E-01, | 3.1147787E-01, | DATA 485 |
| 670 | 492                           | 3.2812820E-01, | 3.2243369E-01, | 3.0452038E-01, | 2.7314179E-01, | DATA 486 |
| 671 | 493                           | 2.3043430E-01, | 1.7840094E-01, | 1.1929115E-01, | 5.4911880E-02, | DATA 487 |
| 672 | 494                           | 1.2638966E-02, | 8.1093644E-02, | 1.4775283E-01, | 2.8932423E-01, | DATA 488 |
| 673 | 495                           | 2.6189968E-01, | 3.0120024E-01, | 3.2318196E-01, | 3.2492632E-01, | DATA 489 |
| 674 | 496                           | 3.0347775E-01, | 2.6618126E-01, | 2.1033280E-01, | 1.4239898E-01, | DATA 490 |
| 675 | 497                           | 6.7172054E-02, | 1.0690673E-02, | 8.6787100E-02, | 1.5736130E-01, | DATA 491 |
| 676 | 498                           | 2.1891738E-01, | 2.6848487E-01, | 3.0573779E-01, | 3.2320422E-01, | DATA 492 |
| 677 | 499                           | 3.2612783E-01, | 3.1397956E-01, | 2.8728560E-01, | 2.4832893E-01, | DATA 493 |
| 678 | DATA (BCHMOON1), I:181,216, / |                |                |                |                | DATA 494 |
| 679 | 501                           | 1.9933592E-01, | 1.4234339E-01, | 8.8092309E-02, | 1.4041676E-02, | DATA 495 |
| 680 | 502                           | 5.3314530E-02, | 1.2026500E-01, | 1.8346927E-01, | 2.3978449E-01, | DATA 496 |
| 681 | 503                           | 2.8824414E-01, | 3.1554762E-01, | 3.2677677E-01, | 3.1643618E-01, | DATA 497 |
| 682 | 504                           | 2.8637660E-01, | 2.3305389E-01, | 1.0698063E-01, | 9.1533062E-02, | DATA 498 |
| 683 | 505                           | 1.2287319E-02, | 6.5857960E-02, | 1.8872841E-01, | 2.8288037E-01, | DATA 499 |
| 684 | 506                           | 2.5552478E-01, | 2.9450480E-01, | 3.1835610E-01, | 7.2641088E-01, | DATA 490 |
| 685 | 507                           | 3.1886468E-01, | 2.9673558E-01, | 2.6170039E-01, | 2.1505528E-01, | DATA 491 |
| 686 | 508                           | 1.6147755E-01, | 1.0085252E-01, | 3.6195797E-02, | 3.8328403E-02, | DATA 492 |
| 687 | 509                           | 9.4808649E-02, | 1.5993076E-01, | 2.1760137E-01, | 2.4681423E-01, | DATA 493 |
| 688 | DATA (BCHMOON1), I:217,252, / |                |                |                |                | DATA 494 |
| 689 | 511                           | 3.0318469E-01, | 3.2295753E-01, | 3.2275315E-01, | 9.8075816E-01, | DATA 495 |
| 690 | 512                           | 2.5757438E-01, | 1.9640277E-01, | 1.2244998E-01, | 4.1794160E-02, | DATA 496 |
| 691 | 513                           | 3.9898302E-02, | 1.1655763E-01, | 1.8495873E-01, | 2.4171098E-01, | DATA 497 |
| 692 | 514                           | 2.8664710E-01, | 3.1242585E-01, | 3.2447922E-01, | 3.2098065E-01, | DATA 498 |
| 693 | 515                           | 3.0278997E-01, | 2.7134821E-01, | 2.8528375E-01, | 1.8647256E-01, | DATA 499 |
| 694 | 516                           | 1.1745139E-01, | 5.3770179E-02, | 1.2267920E-02, | 7.8341217E-02, | DATA 490 |
| 695 | 517                           | 1.4204220E-01, | 2.0077469E-01, | 2.9165917E-01, | 2.9165917E-01, | DATA 491 |
| 696 | 518                           | 3.1688720E-01, | 3.2460098E-01, | 3.2222203E-01, | 2.7892759E-01, | DATA 492 |
| 697 | 519                           | 2.2688074E-01, | 1.5731734E-01, | 7.8036796E-02, | 5.2087254E-03, | DATA 493 |
| 698 | DATA (BCHMOON1), I:253,288, / |                |                |                |                | DATA 494 |
| 699 | 521                           | 3.7128634E-02, | 1.6150071E-01, | 2.2448028E-01, | 2.7323594E-01, | DATA 495 |
| 700 | 522                           | 3.0619717E-01, | 3.2268923E-01, | 3.2314336E-01, | 3.8550521E-01, | DATA 496 |
| 701 | 523                           | 2.8024818E-01, | 2.4017682E-01, | 1.9030355E-01, | 1.8277113E-01, | DATA 497 |
| 702 | 524                           | 6.9814970E-02, | 3.7559217E-03, | 6.2986648E-02, | 1.2786968E-01, | DATA 498 |
| 703 | 525                           | 1.8819837E-01, | 2.4111127E-01, | 2.8360806E-01, | 3.1266310E-01, | DATA 499 |
| 704 | 526                           | 3.2847070E-01, | 3.1983598E-01, | 2.9465198E-01, | 2.8035106E-01, | DATA 490 |
| 705 | 527                           | 1.6913266E-01, | 1.1483743E-01, | 3.2762049E-02, | 5.1135168E-02, | DATA 491 |
| 706 | 528                           | 1.3085970E-01, | 2.0109306E-01, | 2.9771712E-01, | 2.9888901E-01, | DATA 492 |
| 707 | 529                           | 3.2105629E-01, | 3.2675897E-01, | 3.1630097E-01, | 2.9138907E-01, | DATA 493 |
| 708 | DATA (BCHMOON1), I:289,324, / |                |                |                |                | DATA 494 |
| 709 | 531                           | 2.5602560E-01, | 2.8631376E-01, | 1.5035735E-01, | 8.8274863E-02, | DATA 495 |
| 710 | 532                           | 2.2851150E-02, | 4.5381222E-02, | 1.2026893E-01, | 1.7499746E-01, | DATA 496 |
| 711 | 533                           | 2.3110787E-01, | 2.7719744E-01, | 3.1012583E-01, | 3.2712894E-01, | DATA 497 |
| 712 | 534                           | 3.2618677E-01, | 3.0640374E-01, | 2.6819275E-01, | 2.1334686E-01, | DATA 498 |
| 713 | 535                           | 1.4191643E-01, | 6.7012784E-02, | 1.9444341E-02, | 9.7055348E-02, | DATA 499 |
| 714 | 536                           | 1.1237991E-01, | 3.3647683E-01, | 2.8245848E-01, | 3.1691478E-01, | DATA 500 |
| 715 | 537                           | 3.3066664E-01, | 3.2559439E-01, | 3.0522049E-01, | 2.7121734E-01, | DATA 501 |
| 716 | 538                           | 2.2600335E-01, | 1.7190980E-01, | 1.1111634E-01, | 4.5713502E-02, | DATA 502 |
| 717 | 539                           | 3.2170927E-02, | 9.0210199E-02, | 1.5574172E-01, | 2.1569240E-01, | DATA 503 |
| 718 | DATA (BCHMOON1), I:325,360, / |                |                |                |                | DATA 504 |
| 719 | 541                           | 2.5668746E-01, | 3.0497883E-01, | 3.2747222E-01, | 3.1681758E-01, | DATA 505 |
| 720 | 542                           | 3.1853229E-01, | 2.8254139E-01, | 2.1713338E-01, | 1.6719012E-01, | DATA 506 |
| 721 | 543                           | 0.2857397E-02, | 1.5051475E-02, | 6.9820032E-02, | 1.4442249E-01, | DATA 507 |
| 722 | 544                           | 2.1270938E-01, | 2.6027441E-01, | 3.8781636E-01, | 3.2938149E-01, | DATA 508 |
| 723 | 545                           | 3.3888922E-01, | 3.1851689E-01, | 2.8927297E-01, | 2.4747333E-01, | DATA 509 |
| 724 | 546                           | 1.9579682E-01, | 1.8673462E-01, | 7.2534935E-02, | 9.2822396E-03, | DATA 510 |
| 725 | 547                           | 6.2920361E-02, | 1.2977797E-01, | 1.9258234E-01, | 2.4811211E-01, | DATA 511 |
| 726 | 548                           | 2.9267800E-01, | 3.2245662E-01, | 3.3410981E-01, | 3.2588275E-01, | DATA 512 |
| 727 | 549                           | 2.9672411E-01, | 2.4940556E-01, | 1.6709905E-01, | 1.1418839E-01, | DATA 513 |
| 728 | DATA (BCHMOON1), I:361,396, / |                |                |                |                | DATA 514 |
| 729 | 551                           | 3.2843988E-02, | 4.4825543E-02, | 1.2193733E-01, | 1.9186956E-01, | DATA 515 |
| 730 | 552                           | 2.9864176E-01, | 2.9561453E-01, | 3.2380723E-01, | 3.4227477E-01, | DATA 516 |
| 731 | DATA (BCHMOON1), I:401,436, / |                |                |                |                | DATA 516 |
| 732 | 561                           | 5.6264833E-01, | 5.6432617E-01, | 5.8853314E-01, | 5.7471180E-01, | DATA 517 |
| 733 | 562                           | 5.8818435E-01, | 5.9027228E-01, | 5.9838860E-01, | 6.2608801E-01, | DATA 518 |
| 734 | 563                           | 6.1807909E-01, | 6.1920488E-01, | 6.2441808E-01, | 6.2891972E-01, | DATA 519 |
| 735 | 564                           | 6.3213807E-01, | 6.3468388E-01, | 6.3832785E-01, | 6.4689338E-01, | DATA 520 |
| 736 | 565                           | 6.3655073E-01, | 6.389562E-01,  | 6.3175789E-01, | 6.2714867E-01, | DATA 521 |



|      |                                 |               |               |                |               |      |          |
|------|---------------------------------|---------------|---------------|----------------|---------------|------|----------|
| 937  | 566                             | 6.2099149E 01 | 6.1338119E 01 | 6.8455970E 01  | 5.9494915E 01 | DATA | 522      |
| 938  | 567                             | 5.8815155E 01 | 5.7591827E 01 | 5.8807885E 01  | 5.8242773E 01 | DATA | 523      |
| 939  | 568                             | 5.8928564E 01 | 5.5987173E 01 | 5.8323543E 01  | 5.8926823E 01 | DATA | 524      |
| 940  | 569                             | 5.1729677E 01 | 5.8651764E 01 | 5.9613125E 01  | 6.8544825E 01 | DATA | 525      |
| 941  | DATA (RMOON II) 11.118 37.721/  |               |               |                |               |      | DATA 526 |
| 942  | 571                             | 6.1881799E 01 | 6.2120303E 01 | 6.2710975E 01  | 6.8158717E 01 | DATA | 527      |
| 943  | 572                             | 6.3888270E 01 | 6.3650067E 01 | 6.3716249E 01  | 6.3677358E 01 | DATA | 528      |
| 944  | 573                             | 6.3840191E 01 | 6.3306759E 01 | 6.2974786E 01  | 6.2539479E 01 | DATA | 529      |
| 945  | 574                             | 6.1996605E 01 | 6.1346352E 01 | 6.0897496E 01  | 5.9771357E 01 | DATA | 530      |
| 946  | 575                             | 5.9904716E 01 | 5.8050511E 01 | 5.9273249E 01  | 5.8652810E 01 | DATA | 531      |
| 947  | 576                             | 5.6851228E 01 | 5.6124658E 01 | 5.8296666E 01  | 5.8758431E 01 | DATA | 532      |
| 948  | 577                             | 5.7459744E 01 | 5.9337630E 01 | 5.9308857E 01  | 6.0292373E 01 | DATA | 533      |
| 949  | 578                             | 6.1217041E 01 | 6.2027277E 01 | 6.2685585E 01  | 6.3172112E 01 | DATA | 534      |
| 950  | 579                             | 6.3482568E 01 | 6.3625082E 01 | 6.3616509E 01  | 6.3478828E 01 | DATA | 535      |
| 951  | DATA (RMOON II) 11.118 73.108/  |               |               |                |               |      | DATA 536 |
| 952  | 581                             | 6.3233960E 01 | 6.2903622E 01 | 6.2504057E 01  | 6.2046473E 01 | DATA | 537      |
| 953  | 582                             | 6.1537204E 01 | 6.0979653E 01 | 6.0377436E 01  | 5.9738258E 01 | DATA | 538      |
| 954  | 583                             | 5.9077900E 01 | 5.8423303E 01 | 5.9813595E 01  | 5.8298095E 01 | DATA | 539      |
| 955  | 584                             | 5.6930784E 01 | 5.6761613E 01 | 5.6826272E 01  | 5.8137261E 01 | DATA | 540      |
| 956  | 585                             | 5.7679228E 01 | 5.8410174E 01 | 5.9268016E 01  | 6.0180205E 01 | DATA | 541      |
| 957  | 586                             | 6.1073693E 01 | 6.1883136E 01 | 6.2558466E 01  | 6.3057817E 01 | DATA | 542      |
| 958  | 587                             | 6.3368258E 01 | 6.3484922E 01 | 6.3419025E 01  | 6.3193050E 01 | DATA | 543      |
| 959  | 588                             | 6.2837417E 01 | 6.2388621E 01 | 6.2875432E 01  | 6.335267E 01  | DATA | 544      |
| 960  | 589                             | 6.0791434E 01 | 6.0261763E 01 | 5.9756917E 01  | 5.9282482E 01 | DATA | 545      |
| 961  | DATA (RMOON II) 11.118 109.144/ |               |               |                |               |      | DATA 546 |
| 962  | 591                             | 5.8842062E 01 | 5.8441717E 01 | 5.8092874E 01  | 5.7814418E 01 | DATA | 547      |
| 963  | 592                             | 5.7631967E 01 | 5.7374438E 01 | 5.7668205E 01  | 5.7930217E 01 | DATA | 548      |
| 964  | 593                             | 5.8361995E 01 | 5.8946294E 01 | 5.9647471E 01  | 6.0415352E 01 | DATA | 549      |
| 965  | 594                             | 6.1191446E 01 | 6.1915917E 01 | 6.2533968E 01  | 6.3000815E 01 | DATA | 550      |
| 966  | 595                             | 6.3285025E 01 | 6.3370324E 01 | 6.3256124E 01  | 6.2956924E 01 | DATA | 551      |
| 967  | 596                             | 6.2800690E 01 | 6.1926244E 01 | 6.1279644E 01  | 6.0609685E 01 | DATA | 552      |
| 968  | 597                             | 5.9962882E 01 | 5.9378615E 01 | 5.8885361E 01  | 5.8498878E 01 | DATA | 553      |
| 969  | 598                             | 5.8222851E 01 | 5.8051878E 01 | 5.7976009E 01  | 5.7895497E 01 | DATA | 554      |
| 970  | 599                             | 5.674453E 01  | 5.6242356E 01 | 5.6493055E 01  | 5.6831638E 01 | DATA | 555      |
| 971  | DATA (RMOON II) 11.118 149.180/ |               |               |                |               |      | DATA 556 |
| 972  | 603                             | 5.9260123E 01 | 5.9773222E 01 | 6.0355400E 01  | 6.0980006E 01 | DATA | 557      |
| 973  | 602                             | 6.1618648E 01 | 6.2204441E 01 | 6.2716342E 01  | 6.3103795E 01 | DATA | 558      |
| 974  | 603                             | 6.3331014E 01 | 6.3372574E 01 | 6.3216104E 01  | 6.2864053E 01 | DATA | 559      |
| 975  | 604                             | 6.2834486E 01 | 6.1660734E 01 | 6.0839716E 01  | 6.0078603E 01 | DATA | 560      |
| 976  | 605                             | 5.9289730E 01 | 5.8583928E 01 | 5.8013143E 01  | 5.7613742E 01 | DATA | 561      |
| 977  | 606                             | 5.7402264E 01 | 5.7374935E 01 | 5.7311164E 01  | 5.8775751E 01 | DATA | 562      |
| 978  | 607                             | 5.9147198E 01 | 5.8981940E 01 | 5.9060137E 01  | 5.9568637E 01 | DATA | 563      |
| 979  | 608                             | 6.0088672E 01 | 6.0622741E 01 | 6.1160925E 01  | 6.1692630E 01 | DATA | 564      |
| 980  | 609                             | 6.2201375E 01 | 6.2664777E 01 | 6.3034586E 01  | 6.3400067E 01 | DATA | 565      |
| 981  | DATA (RMOON II) 11.118 181.218/ |               |               |                |               |      | DATA 566 |
| 982  | 611                             | 6.490716E 01  | 6.3479982E 01 | 6.3288915E 01  | 6.2969511E 01 | DATA | 567      |
| 983  | 612                             | 6.2347509E 01 | 6.1624389E 01 | 6.0778231E 01  | 5.9842918E 01 | DATA | 568      |
| 984  | 613                             | 5.8949676E 01 | 5.8098311E 01 | 5.7394773E 01  | 5.6895012E 01 | DATA | 569      |
| 985  | 614                             | 5.6438342E 01 | 5.6636557E 01 | 5.6873236E 01  | 5.8363957E 01 | DATA | 570      |
| 986  | 615                             | 5.7890557E 01 | 5.8561410E 01 | 5.9269970E 01  | 5.9975204E 01 | DATA | 571      |
| 987  | 616                             | 6.0448260E 01 | 6.1271629E 01 | 6.1836120E 01  | 6.2337143E 01 | DATA | 572      |
| 988  | 617                             | 6.2171024E 01 | 6.3131965E 01 | 6.4110159E 01  | 6.5591361E 01 | DATA | 573      |
| 989  | 618                             | 6.3657831E 01 | 6.3590402E 01 | 6.3371382E 01  | 6.2988131E 01 | DATA | 574      |
| 990  | 619                             | 6.243685E 01  | 6.1726164E 01 | 6.0880013E 01  | 5.9939468E 01 | DATA | 575      |
| 991  | DATA (RMOON II) 11.118 217.252/ |               |               |                |               |      | DATA 576 |
| 992  | 621                             | 5.8962598E 01 | 5.8021553E 01 | 5.7196115E 01  | 5.6563657E 01 | DATA | 577      |
| 993  | 622                             | 5.6186794E 01 | 5.6101721E 01 | 5.6311093E 01  | 5.6786170E 01 | DATA | 578      |
| 994  | 623                             | 5.7664224E 01 | 5.8280427E 01 | 5.9160220E 01  | 6.0039064E 01 | DATA | 579      |
| 995  | 624                             | 6.0866247E 01 | 6.1606868E 01 | 6.2240812E 01  | 6.2759840E 01 | DATA | 580      |
| 996  | 625                             | 6.3163840E 01 | 6.3456903E 01 | 6.3643702E 01  | 6.3726715E 01 | DATA | 581      |
| 997  | 626                             | 6.3704063E 01 | 6.3972289E 01 | 6.4321321E 01  | 6.2942689E 01 | DATA | 582      |
| 998  | 627                             | 6.2429846E 01 | 6.1782726E 01 | 6.1011709E 01  | 6.0141108E 01 | DATA | 583      |
| 999  | 628                             | 5.9211548E 01 | 5.8280277E 01 | 5.7418278E 01  | 5.5703587E 01 | DATA | 584      |
| 1000 | 629                             | 5.6209472E 01 | 5.5993364E 01 | 5.6082999E 01  | 5.6470859E 01 | DATA | 585      |
| 1001 | DATA (RMOON II) 11.118 253.288/ |               |               |                |               |      | DATA 586 |
| 1002 | 631                             | 5.7115285E 01 | 5.7949208E 01 | 5.8892984E 01  | 5.9867110E 01 | DATA | 587      |
| 1003 | 632                             | 6.0801875E 01 | 6.1643023E 01 | 6.2353801E 01  | 6.2914839E 01 | DATA | 588      |
| 1004 | 633                             | 6.3186111E 01 | 6.3971961E 01 | 6.4686260E 01  | 6.5369550E 01 | DATA | 589      |
| 1005 | 634                             | 6.3857592E 01 | 6.4341242E 01 | 6.43035070E 01 | 6.2642159E 01 | DATA | 590      |
| 1006 | 635                             | 6.2162457E 01 | 6.1595499E 01 | 6.0944079E 01  | 6.0218827E 01 | DATA | 591      |
| 1007 | 636                             | 5.9439210E 01 | 5.8641806E 01 | 5.7875318E 01  | 5.7200641E 01 | DATA | 592      |
| 1008 | 637                             | 5.6483785E 01 | 5.6385757E 01 | 5.6350792E 01  | 5.6596124E 01 | DATA | 593      |
| 1009 | 638                             | 5.7106807E 01 | 5.7837541E 01 | 5.8728807E 01  | 5.9678549E 01 | DATA | 594      |

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610      639  6.0632466E 01,  6.1514867E 01,  6.2271951E 01,  6.2867486E 01/ DATA 595
611      DATA (RMDOON (1),1:287,324)/ DATA 596 6
612      641  6.3282590E 01,  6.3514114E 01,  6.3571894E 01,  6.3475399E 01,  DATA 597
613      642  6.3249997E 01,  6.2923163E 01,  6.2520961E 01,  6.2065230E 01,  DATA 598
614      643  6.1871968E 01,  6.1031214E 01,  6.8508589E 01,  2.9948212E 01,  DATA 599
615      644  5.9376522E 01,  5.8806416E 01,  5.8260046E 01,  5.2770237E 01,  DATA 600
616      645  5.7378547E 01,  5.7130267E 01,  5.7066608E 01,  5.7215896E 01,  DATA 601
617      646  5.7804874E 01,  5.8156747E 01,  5.8890322E 01,  5.9726748E 01,  DATA 602
618      647  6.0297746E 01,  6.1434546E 01,  6.2175145E 01,  6.2769852E 01,  DATA 603
619      648  6.3184325E 01,  6.3400845E 01,  6.3418046E 01,  6.3249649E 01,  DATA 604
620      649  6.2921691E 01,  6.2468237E 01,  6.1931574E 01,  6.1352705E 01/ DATA 605
621      DATA (RMDOON (1),1:325,360)/ DATA 606 6
622      651  6.0769801E 01,  6.0213831E 01,  5.9706171E 01,  5.9258178E 01,  DATA 607
623      652  5.8872918E 01,  5.8548732E 01,  5.8283733E 01,  5.8079995E 01,  DATA 608
624      653  5.7946203E 01,  5.7897870E 01,  5.7954419E 01,  5.8136328E 01,  DATA 609
625      654  5.8455098E 01,  5.8911701E 01,  5.9491081E 01,  6.0162132E 01,  DATA 610
626      655  6.0880355E 01,  6.1592826E 01,  6.2244213E 01,  6.2782671E 01,  DATA 611
627      656  6.3164832E 01,  6.3329556E 01,  6.3350383E 01,  6.3136856E 01,  DATA 612
628      657  6.2734692E 01,  6.2174812E 01,  6.1501103E 01,  6.0746807E 01,  DATA 613
629      658  6.0029451E 01,  5.9344685E 01,  5.8759749E 01,  5.8387908E 01,  DATA 614
630      659  5.8605177E 01,  5.7850526E 01,  5.7329311E 01,  5.6919192E 01/ DATA 615
631      DATA (RMDOON (1),1:361,368)/ DATA 616 6
632      661  5.8096675E 01,  5.8342409E 01,  5.8644217E 01,  5.8997801E 01,  DATA 617
633      662  5.9401387E 01,  5.9857723E 01,  6.0363628E 01,  6.0909892E 01/ DATA 618
634      END DATA 619 6

```

29748 WORDS OF MEMORY USED BY THIS COMPILATION

71054 02 12-03-72 11.426 1979 EPHEMERIS

# PREFACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

## PRIMARY SYMDEF ENTRY

TABLE 0

## SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1 EPMBLK 11

## SYNREF

END OF BINARY CARD \*1979\*19  
4273 IS THE NEXT AVAILABLE LOCATION.  
GNAP VERSION/ASSEMBLY DATES JNPA 110171/102971 JNPD 110171/102971 JNPC 110171/102971  
THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY  
\*\* 19421 WORDS OF MEMORY WERE USED BY GNAP FOR THIS ASSEMBLY.

71054 02 12-03-72 11.837 1980 EPHEMERIS

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1      C*1980*      1980 EPHEMERIS DATA 1
2      SUBROUTINE TABLE DATA 2
3      DIMENSION RASUN (369), DCSUN (369), RSUN (369) DATA 3
4      DIMENSION RAMDOON(369), DCMDOON(369), RMDOON(369) DATA 4
5      DIMENSION ARRAY(2214)
6      DOUBLE PRECISION V
7      EQUIVALENCE (RASUN,ARRAY), (DCSUN,ARRAY(370)), (RSUN,ARRAY(739))
8      EQUIVALENCE (RAMDOON,ARRAY(1106)), (DCMDOON,ARRAY(1477))
9      EQUIVALENCE (RMDOON,ARRAY(1846))
10     COMMON /EPMBLK/ V(4), I
11     Y(1) = ARRAY(1)
12     Y(2) = ARRAY(1+1) 2
13     Y(3) = ARRAY(1+2) 3
14     Y(4) = ARRAY(1+3) 4

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|     |                                |                 |                 |                 |                  |          |
|-----|--------------------------------|-----------------|-----------------|-----------------|------------------|----------|
| 88  | 82                             | 2,9868855E 08,  | 3,0025479E 00,  | 3,0182091E 00,  | 3,6338887E 00,   | DATA 78  |
| 89  | 83                             | 3,0498098E 08,  | 3,0651599E 00,  | 3,0808102E 00,  | 3,8964622E 00,   | DATA 79  |
| 90  | 84                             | 3,1421175E 08,  | 3,1277776E 00,  | 3,1434440E 00,  | 3,8591187E 00,   | DATA 80  |
| 91  | 85                             | 3,1748036E 08,  | 3,1909008E 00,  | 3,2062122E 00,  | 3,2219396E 00,   | DATA 81  |
| 92  | 86                             | 3,2876846E 08,  | 3,2534488E 00,  | 3,2692341E 00,  | 3,2850415E 00,   | DATA 82  |
| 93  | 87                             | 3,3008724E 08,  | 3,3167281E 00,  | 3,3326099E 00,  | 3,8485192E 00,   | DATA 83  |
| 94  | 88                             | 3,3644972E 08,  | 3,3804252E 00,  | 3,3964246E 00,  | 3,6124563E 00,   | DATA 84  |
| 95  | 89                             | 3,4285218E 08,  | 3,4446221E 00,  | 3,4607585E 00,  | 3,4769321E 00,   | DATA 85  |
| 96  | DATA (RASUN 1), I#289,324, /   |                 |                 |                 |                  | DATA 86  |
| 97  | 91                             | 3,4931441E 00,  | 3,5093955E 00,  | 3,5256874E 00,  | 3,5420216E 00,   | DATA 87  |
| 98  | 92                             | 3,5983974E 00,  | 3,5748179E 00,  | 3,5917335E 00,  | 3,6077959E 00,   | DATA 88  |
| 99  | 93                             | 3,6243568E 00,  | 3,6409675E 00,  | 3,6576297E 00,  | 3,6743446E 00,   | DATA 89  |
| 100 | 94                             | 3,6911135E 00,  | 3,7079374E 00,  | 3,7248177E 00,  | 3,7417549E 00,   | DATA 90  |
| 101 | 95                             | 3,7587498E 00,  | 3,7758032E 00,  | 3,7929157E 00,  | 3,8100878E 00,   | DATA 91  |
| 102 | 96                             | 3,8273201E 00,  | 3,8446130E 00,  | 3,8619669E 00,  | 3,8793819E 00,   | DATA 92  |
| 103 | 97                             | 3,8968583E 00,  | 3,9143960E 00,  | 3,9319952E 00,  | 3,9496856E 00,   | DATA 93  |
| 104 | 98                             | 3,9673771E 00,  | 3,9851594E 00,  | 4,0030021E 00,  | 4,0209050E 00,   | DATA 94  |
| 105 | 99                             | 4,0388675E 00,  | 4,0568893E 00,  | 4,0749703E 00,  | 4,0931101E 00,   | DATA 95  |
| 106 | DATA (RASUN 1), I#325,360, /   |                 |                 |                 |                  | DATA 96  |
| 107 | 101                            | 4,1113087E 00,  | 4,1295658E 00,  | 4,1478809E 00,  | 4,1662538E 00,   | DATA 97  |
| 108 | 102                            | 4,1846840E 00,  | 4,2031706E 00,  | 4,2217132E 00,  | 4,2403105E 00,   | DATA 98  |
| 109 | 103                            | 4,2589614E 00,  | 4,2776648E 00,  | 4,2964194E 00,  | 4,3152239E 00,   | DATA 99  |
| 110 | 104                            | 4,3340768E 00,  | 4,3529763E 00,  | 4,3719208E 00,  | 4,3909084E 00,   | DATA 100 |
| 111 | 105                            | 4,4099370E 00,  | 4,4290046E 00,  | 4,4481090E 00,  | 4,4672478E 00,   | DATA 101 |
| 112 | 106                            | 4,4864187E 00,  | 4,5056190E 00,  | 4,5248463E 00,  | 4,5440981E 00,   | DATA 102 |
| 113 | 107                            | 4,5633718E 00,  | 4,5826651E 00,  | 4,6019754E 00,  | 4,6213006E 00,   | DATA 103 |
| 114 | 108                            | 4,6406386E 00,  | 4,6599873E 00,  | 4,6793442E 00,  | 4,6987072E 00,   | DATA 104 |
| 115 | 109                            | 4,7187743E 00,  | 4,7377443E 00,  | 4,7568116E 00,  | 4,7761774E 00,   | DATA 105 |
| 116 | DATA (RASUN 1), I#361,368, /   |                 |                 |                 |                  | DATA 106 |
| 117 | 111                            | 4,7955381E 00,  | 4,8148916E 00,  | 4,8342357E 00,  | 4,8535680E 00,   | DATA 107 |
| 118 | 112                            | 4,8728862E 00,  | 4,8921880E 00,  | 4,9114709E 00,  | 4,9307828E 00,   | DATA 108 |
| 119 | DATA (RCSUN 1), I# 1, 361, /   |                 |                 |                 |                  | DATA 109 |
| 120 | 121                            | -4,0412086E-01, | -4,0289032E-01, | -4,0152566E-01, | -4,0002749E-01,  | DATA 109 |
| 121 | 122                            | -3,9839657E-01, | -3,9663367E-01, | -3,9473968E-01, | -3,9271546E-01,  | DATA 110 |
| 122 | 123                            | -3,9056194E-01, | -3,8828018E-01, | -3,8587128E-01, | -3,8333636E-01,  | DATA 111 |
| 123 | 124                            | -3,8067662E-01, | -3,7789338E-01, | -3,7498799E-01, | -3,7194182E-01,  | DATA 112 |
| 124 | 125                            | -3,6881636E-01, | -3,6553312E-01, | -3,6217369E-01, | -3,5867963E-01,  | DATA 113 |
| 125 | 126                            | -3,5507257E-01, | -3,5139416E-01, | -3,4752605E-01, | -3,4359001E-01,  | DATA 114 |
| 126 | 127                            | -3,3954775E-01, | -3,3540101E-01, | -3,3115164E-01, | -3,2680155E-01,  | DATA 115 |
| 127 | 128                            | -3,2232546E-01, | -3,1780652E-01, | -3,1316338E-01, | -3,0843095E-01,  | DATA 116 |
| 128 | 129                            | -3,0360517E-01, | -2,9868988E-01, | -2,9368703E-01, | -2,8859847E-01,  | DATA 117 |
| 129 | DATA (RCSUN 1), I# 37, 72, /   |                 |                 |                 |                  | DATA 118 |
| 130 | 131                            | -2,8342618E-01, | -2,7817203E-01, | -2,7233798E-01, | -2,6442601E-01,  | DATA 119 |
| 131 | 132                            | -2,6193807E-01, | -2,5637614E-01, | -2,5074228E-01, | -2,4503843E-01,  | DATA 120 |
| 132 | 133                            | -2,3926676E-01, | -2,3342932E-01, | -2,2752828E-01, | -2,2156549E-01,  | DATA 121 |
| 133 | 134                            | -2,1543233E-01, | -2,0946355E-01, | -2,0332848E-01, | -1,9714017E-01,  | DATA 122 |
| 134 | 135                            | -1,9090056E-01, | -1,8461173E-01, | -1,7827572E-01, | -1,7189456E-01,  | DATA 123 |
| 135 | 136                            | -1,6947027E-01, | -1,5900480E-01, | -1,5250011E-01, | -1,45938067E-01, | DATA 124 |
| 136 | 137                            | -1,3276969E-01, | -1,2612700E-01, | -1,1945444E-01, | -1,1275883E-01,  | DATA 125 |
| 137 | 138                            | -1,0402698E-01, | -9,9279716E-02, | -9,2501825E-02, | -8,5767104E-02,  | DATA 126 |
| 138 | 139                            | -7,8893362E-02, | -7,2062413E-02, | -6,5216061E-02, | -5,8356198E-02,  | DATA 127 |
| 139 | DATA (RCSUN 1), I# 73, 108, /  |                 |                 |                 |                  | DATA 128 |
| 140 | 141                            | -5,1484697E-02, | -4,4603425E-02, | -3,7714170E-02, | -3,0818898E-02,  | DATA 129 |
| 141 | 142                            | -2,3919479E-02, | -1,7017785E-02, | -1,0115693E-02, | -3,2180430E-03,  | DATA 130 |
| 142 | 143                            | 3,6924069E-03,  | 1,0374724E-02,  | 1,5460019E-02,  | 2,4336570E-02,   | DATA 131 |
| 143 | 144                            | 3,1202604E-02,  | 3,8056381E-02,  | 4,4896183E-02,  | 5,1720843E-02,   | DATA 132 |
| 144 | 145                            | 5,8827207E-02,  | 6,5315141E-02,  | 7,2082266E-02,  | 7,8827750E-02,   | DATA 133 |
| 145 | 146                            | 8,5549220E-02,  | 9,2265338E-02,  | 9,8914513E-02,  | 1,0558517E-01,   | DATA 134 |
| 146 | 147                            | 1,1216574E-01,  | 1,1874459E-01,  | 1,2529012E-01,  | 1,3180067E-01,   | DATA 135 |
| 147 | 148                            | 1,3827458E-01,  | 1,4471018E-01,  | 1,5110389E-01,  | 1,5745993E-01,   | DATA 136 |
| 148 | 149                            | 1,6377039E-01,  | 1,7003585E-01,  | 1,7625494E-01,  | 1,8242475E-01,   | DATA 137 |
| 149 | DATA (RCSUN 1), I# 140, 144, / |                 |                 |                 |                  | DATA 138 |
| 150 | 151                            | 1,8854472E-01,  | 1,9461275E-01,  | 2,0062708E-01,  | 2,0658604E-01,   | DATA 139 |
| 151 | 152                            | 2,1487994E-01,  | 2,1833128E-01,  | 2,2411428E-01,  | 2,2983542E-01,   | DATA 140 |
| 152 | 153                            | 2,3849316E-01,  | 2,4108597E-01,  | 2,4661234E-01,  | 2,5207081E-01,   | DATA 141 |
| 153 | 154                            | 2,8745987E-01,  | 2,8277806E-01,  | 2,8802394E-01,  | 2,7319406E-01,   | DATA 142 |
| 154 | 155                            | 2,7829299E-01,  | 2,8331329E-01,  | 2,8825594E-01,  | 2,9311823E-01,   | DATA 143 |
| 155 | 156                            | 2,9789993E-01,  | 3,0259913E-01,  | 3,0721450E-01,  | 3,1174445E-01,   | DATA 144 |
| 156 | 157                            | 3,1618755E-01,  | 3,2054238E-01,  | 3,2480758E-01,  | 3,2898163E-01,   | DATA 145 |
| 157 | 158                            | 3,3806319E-01,  | 3,3705084E-01,  | 3,4094312E-01,  | 3,4473868E-01,   | DATA 146 |
| 158 | 159                            | 3,4843626E-01,  | 3,5203449E-01,  | 3,5533212E-01,  | 3,5892794E-01,   | DATA 147 |
| 159 | DATA (RCSUN 1), I# 145, 180, / |                 |                 |                 |                  | DATA 148 |
| 160 | 161                            | 3,6222086E-01,  | 3,6540968E-01,  | 3,6849340E-01,  | 3,7147095E-01,   | DATA 149 |

|     |                             |                |                |                |                |          |
|-----|-----------------------------|----------------|----------------|----------------|----------------|----------|
| 161 | 162                         | 3.7434137E=01, | 3.7710368E=01, | 3.7973696E=01, | 3.8230037E=01, | DATA 150 |
| 162 | 163                         | 3.8473302E=01, | 3.8702420E=01, | 3.8926300E=01, | 3.9138895E=01, | DATA 151 |
| 163 | 164                         | 3.9234040E=01, | 3.9520757E=01, | 3.9695941E=01, | 3.989532E=01,  | DATA 152 |
| 164 | 165                         | 4.011446E=01,  | 4.0151692E=01, | 4.0280161E=01, | 4.0394630E=01, | DATA 153 |
| 165 | 166                         | 4.03164E=01,   | 4.054278E=01,  | 4.0672586E=01, | 4.0744641E=01, | DATA 154 |
| 166 | 167                         | 4.011711E=01,  | 4.0846772E=01, | 4.0879612E=01, | 4.0900816E=01, | DATA 155 |
| 167 | 168                         | 4.0909785E=01, | 4.0906717E=01, | 4.0891618E=01, | 4.0864499E=01, | DATA 156 |
| 168 | 169                         | 4.0825385E=01, | 4.0774290E=01, | 4.0721249E=01, | 4.0636295E=01, | DATA 157 |
| 169 | DATA (BCSUM (I),I=181,216)/ |                |                |                |                | DATA 158 |
| 170 | 171                         | 4.0549459E=01, | 4.0450786E=01, | 4.0340313E=01, | 4.0218090E=01, | DATA 159 |
| 171 | 172                         | 4.0084160E=01, | 3.9938581E=01, | 3.9781403E=01, | 3.9612690E=01, | DATA 160 |
| 172 | 173                         | 3.9432511E=01, | 3.9240943E=01, | 3.9038064E=01, | 3.8823299E=01, | DATA 161 |
| 173 | 174                         | 3.8998710E=01, | 3.8362416E=01, | 3.8115166E=01, | 3.7897053E=01, | DATA 162 |
| 174 | 175                         | 3.7988179E=01, | 3.7308631E=01, | 3.7018530E=01, | 3.6717973E=01, | DATA 163 |
| 175 | 176                         | 3.6407077E=01, | 3.6085953E=01, | 3.5754715E=01, | 3.543488E=01,  | DATA 164 |
| 176 | 177                         | 3.5062391E=01, | 3.4701551E=01, | 3.4331095E=01, | 3.3951255E=01, | DATA 165 |
| 177 | 178                         | 3.3861893E=01, | 3.3163318E=01, | 3.2755683E=01, | 3.2339074E=01, | DATA 166 |
| 178 | 179                         | 3.1913616E=01, | 3.1479439E=01, | 3.1036669E=01, | 3.0583446E=01, | DATA 167 |
| 179 | DATA (BCSUM (I),I=217,252)/ |                |                |                |                | DATA 168 |
| 180 | 181                         | 3.0125909E=01, | 2.9658202E=01, | 2.9182472E=01, | 2.8698870E=01, | DATA 169 |
| 181 | 182                         | 2.8207546E=01, | 2.7708655E=01, | 2.7202349E=01, | 2.6683777E=01, | DATA 170 |
| 182 | 183                         | 2.6168098E=01, | 2.5640458E=01, | 2.5106018E=01, | 2.4564929E=01, | DATA 171 |
| 183 | 184                         | 2.4017345E=01, | 2.3463423E=01, | 2.2903115E=01, | 2.2337184E=01, | DATA 172 |
| 184 | 185                         | 2.1765181E=01, | 2.1187466E=01, | 2.0604196E=01, | 2.0015525E=01, | DATA 173 |
| 185 | 186                         | 1.9421609E=01, | 1.8822597E=01, | 1.8218642E=01, | 1.7609884E=01, | DATA 174 |
| 186 | 187                         | 1.6996465E=01, | 1.6378527E=01, | 1.5756207E=01, | 1.5129657E=01, | DATA 175 |
| 187 | 188                         | 1.4499028E=01, | 1.3864473E=01, | 1.3226144E=01, | 1.2584207E=01, | DATA 176 |
| 188 | 189                         | 1.1938825E=01, | 1.1290160E=01, | 1.0638374E=01, | 9.9836312E=02, | DATA 177 |
| 189 | DATA (BCSUM (I),I=253,289)/ |                |                |                |                | DATA 178 |
| 190 | 191                         | 9.3260936E=02, | 8.6659252E=02, | 8.0032914E=02, | 7.3383561E=02, | DATA 179 |
| 191 | 192                         | 6.6712844E=02, | 6.0223417E=02, | 5.3313940E=02, | 4.6589070E=02, | DATA 180 |
| 192 | 193                         | 3.9849483E=02, | 3.3096846E=02, | 2.6332865E=02, | 1.9559178E=02, | DATA 181 |
| 193 | 194                         | 1.2777434E=02, | 5.9892663E=02, | 2.0364399E=02, | 7.5998351E=03, | DATA 182 |
| 194 | 195                         | 1.4397803E=02, | 2.1196048E=02, | 2.7993081E=02, | 3.4787328E=02, | DATA 183 |
| 195 | 196                         | 4.1377199E=02, | 4.8361071E=02, | 5.5137349E=02, | 6.1904232E=02, | DATA 184 |
| 196 | 197                         | 6.8459973E=02, | 7.5402796E=02, | 8.2130942E=02, | 8.8842615E=02, | DATA 185 |
| 197 | 198                         | 9.5836007E=02, | 1.0220931E=01, | 1.0886059E=01, | 1.1548829E=01, | DATA 186 |
| 198 | 199                         | 1.2209027E=01, | 1.2866473E=01, | 1.3520982E=01, | 1.4172863E=01, | DATA 187 |
| 199 | DATA (BCSUM (I),I=289,324)/ |                |                |                |                | DATA 188 |
| 200 | 201                         | 1.4820425E=01, | 1.5464977E=01, | 1.6105824E=01, | 1.6742776E=01, | DATA 189 |
| 201 | 202                         | 1.7375636E=01, | 1.8004219E=01, | 1.8628320E=01, | 1.9247772E=01, | DATA 190 |
| 202 | 203                         | 1.9862393E=01, | 2.0472005E=01, | 2.1076433E=01, | 2.1673496E=01, | DATA 191 |
| 203 | 204                         | 2.2690144E=01, | 2.2856801E=01, | 2.3438681E=01, | 2.4014443E=01, | DATA 192 |
| 204 | 205                         | 2.4883999E=01, | 2.5146846E=01, | 2.5703090E=01, | 2.6252428E=01, | DATA 193 |
| 205 | 206                         | 2.6794662E=01, | 2.732992E=01,  | 2.7837016E=01, | 2.8374731E=01, | DATA 194 |
| 206 | 207                         | 2.888542E=01,  | 2.9392246E=01, | 2.9887636E=01, | 3.0374518E=01, | DATA 195 |
| 207 | 208                         | 3.0852686E=01, | 3.1321946E=01, | 3.1782096E=01, | 3.2232940E=01, | DATA 196 |
| 208 | 209                         | 3.2674279E=01, | 3.3109921E=01, | 3.3527675E=01, | 3.3939366E=01, | DATA 197 |
| 209 | DATA (BCSUM (I),I=325,360)/ |                |                |                |                | DATA 198 |
| 210 | 211                         | 3.4340819E=01, | 3.4731863E=01, | 3.5112336E=01, | 3.5482078E=01, | DATA 199 |
| 211 | 212                         | 3.5840926E=01, | 3.6188725E=01, | 3.6525322E=01, | 3.6850551E=01, | DATA 200 |
| 212 | 213                         | 3.7164255E=01, | 3.7466286E=01, | 3.7756496E=01, | 3.8034731E=01, | DATA 201 |
| 213 | 214                         | 3.8300857E=01, | 3.8554736E=01, | 3.8796239E=01, | 3.9025236E=01, | DATA 202 |
| 214 | 215                         | 3.941607E=01,  | 3.9445236E=01, | 3.9630014E=01, | 3.9813836E=01, | DATA 203 |
| 215 | 216                         | 3.9978597E=01, | 4.0130210E=01, | 4.0268581E=01, | 4.0393832E=01, | DATA 204 |
| 216 | 217                         | 4.0505281E=01, | 4.0603465E=01, | 4.0688119E=01, | 4.0759197E=01, | DATA 205 |
| 217 | 218                         | 4.0316658E=01, | 4.0860474E=01, | 4.0890622E=01, | 4.0907085E=01, | DATA 206 |
| 218 | 219                         | 4.0909865E=01, | 4.0898949E=01, | 4.0874344E=01, | 4.0834059E=01, | DATA 207 |
| 219 | DATA (BCSUM (I),I=361,396)/ |                |                |                |                | DATA 208 |
| 220 | 221                         | 4.0784105E=01, | 4.0718501E=01, | 4.0639277E=01, | 4.0546466E=01, | DATA 209 |
| 221 | 222                         | 4.0440109E=01, | 4.0320259E=01, | 4.0186971E=01, | 4.0040315E=01, | DATA 210 |
| 222 | DATA (BCSUM (I),I=397,432)/ |                |                |                |                | DATA 211 |
| 223 | 224                         | 9.8394801E=01, | 9.8392766E=01, | 9.8391410E=01, | 9.8390690E=01, | DATA 212 |
| 224 | 225                         | 9.8390613E=01, | 9.8391167E=01, | 9.8392344E=01, | 9.8394127E=01, | DATA 213 |
| 225 | 226                         | 9.8396498E=01, | 9.8399436E=01, | 9.8402921E=01, | 9.8406930E=01, | DATA 214 |
| 226 | 227                         | 9.8411433E=01, | 9.8419404E=01, | 9.8421816E=01, | 9.8427443E=01, | DATA 215 |
| 227 | 228                         | 9.8433863E=01, | 9.8440485E=01, | 9.8447405E=01, | 9.8454675E=01, | DATA 216 |
| 228 | 229                         | 9.8462299E=01, | 9.8470286E=01, | 9.8478652E=01, | 9.8487408E=01, | DATA 217 |
| 229 | 230                         | 9.849659E=01,  | 9.8506252E=01, | 9.8516358E=01, | 9.8527012E=01, | DATA 218 |
| 230 | 231                         | 9.8538202E=01, | 9.8549944E=01, | 9.8562254E=01, | 9.8575149E=01, | DATA 219 |
| 231 | 232                         | 9.8588622E=01, | 9.8602673E=01, | 9.861722E=01,  | 9.8632453E=01, | DATA 220 |
| 232 | DATA (BCSUM (I),I=433,468)/ |                |                |                |                | DATA 221 |
| 233 | 241                         | 9.8648163E=01, | 9.8664393E=01, | 9.8681123E=01, | 9.8698329E=01, | DATA 222 |



|     |                             |               |               |               |               |          |
|-----|-----------------------------|---------------|---------------|---------------|---------------|----------|
| 234 | 242                         | 9.0715982E-01 | 9.0734048E-01 | 9.0752496E-01 | 9.0771305E-01 | DATA 222 |
| 235 | 243                         | 9.0790429E-01 | 9.0809836E-01 | 9.0829498E-01 | 9.0849366E-01 | DATA 223 |
| 236 | 244                         | 9.0869453E-01 | 9.0889755E-01 | 9.0910274E-01 | 9.0930998E-01 | DATA 224 |
| 237 | 245                         | 9.0951963E-01 | 9.0973195E-01 | 9.0994721E-01 | 9.1016576E-01 | DATA 225 |
| 238 | 246                         | 9.1038770E-01 | 9.1061321E-01 | 9.1084245E-01 | 9.1107375E-01 | DATA 226 |
| 239 | 247                         | 9.1155378E-01 | 9.1179870E-01 | 9.1204750E-01 | 9.1230004E-01 | DATA 227 |
| 240 | 248                         | 9.1255615E-01 | 9.1281566E-01 | 9.1307040E-01 | 9.1333440E-01 | DATA 228 |
| 241 | 249                         | 9.1361235E-01 | 9.1388293E-01 | 9.1415561E-01 | 9.1442985E-01 | DATA 229 |
| 242 | DATA (RSUN (1)) : 73.1081/  |               |               |               |               | DATA 230 |
| 243 | 251                         | 9.9470526E-01 | 9.9498145E-01 | 9.9525799E-01 | 9.9553471E-01 | DATA 231 |
| 244 | 252                         | 9.9581142E-01 | 9.9608806E-01 | 9.9636423E-01 | 9.9664029E-01 | DATA 232 |
| 245 | 253                         | 9.9691643E-01 | 9.9719284E-01 | 9.9746983E-01 | 9.9774750E-01 | DATA 233 |
| 246 | 254                         | 9.9802605E-01 | 9.9830368E-01 | 9.9858664E-01 | 9.9886993E-01 | DATA 234 |
| 247 | 255                         | 9.9915263E-01 | 9.9943778E-01 | 9.9972440E-01 | 1.000024E 00  | DATA 235 |
| 248 | 256                         | 1.0003018E 00 | 1.0005924E 00 | 1.0008841E 00 | 1.0011766E 00 | DATA 236 |
| 249 | 257                         | 1.0014698E 00 | 1.0017632E 00 | 1.0020568E 00 | 1.0023501E 00 | DATA 237 |
| 250 | 258                         | 1.0026426E 00 | 1.0029339E 00 | 1.0032256E 00 | 1.0035174E 00 | DATA 238 |
| 251 | 259                         | 1.0037970E 00 | 1.0040802E 00 | 1.0043604E 00 | 1.0046380E 00 | DATA 239 |
| 252 | DATA (RSUN (1)) : 109.1441/ |               |               |               |               | DATA 240 |
| 253 | 261                         | 1.0049131E 00 | 1.0051857E 00 | 1.0054560E 00 | 1.0057242E 00 | DATA 241 |
| 254 | 262                         | 1.0059904E 00 | 1.0062550E 00 | 1.0065182E 00 | 1.0067801E 00 | DATA 242 |
| 255 | 263                         | 1.0070407E 00 | 1.0073003E 00 | 1.0075588E 00 | 1.0078164E 00 | DATA 243 |
| 256 | 264                         | 1.0080730E 00 | 1.0083286E 00 | 1.0085832E 00 | 1.0088367E 00 | DATA 244 |
| 257 | 265                         | 1.0090888E 00 | 1.0093394E 00 | 1.0095883E 00 | 1.0098350E 00 | DATA 245 |
| 258 | 266                         | 1.0100793E 00 | 1.0103207E 00 | 1.0105589E 00 | 1.0107935E 00 | DATA 246 |
| 259 | 267                         | 1.0110241E 00 | 1.0112504E 00 | 1.0114719E 00 | 1.0116887E 00 | DATA 247 |
| 260 | 268                         | 1.0119009E 00 | 1.0121084E 00 | 1.0123113E 00 | 1.0125090E 00 | DATA 248 |
| 261 | 269                         | 1.0127040E 00 | 1.0128943E 00 | 1.0130808E 00 | 1.0132637E 00 | DATA 249 |
| 262 | DATA (RSUN (1)) : 145.1801/ |               |               |               |               | DATA 250 |
| 263 | 271                         | 1.0134433E 00 | 1.0136196E 00 | 1.0137928E 00 | 1.0139631E 00 | DATA 251 |
| 264 | 272                         | 1.0141306E 00 | 1.0142994E 00 | 1.0144575E 00 | 1.0146149E 00 | DATA 252 |
| 265 | 273                         | 1.0147735E 00 | 1.0149273E 00 | 1.0150781E 00 | 1.0152257E 00 | DATA 253 |
| 266 | 274                         | 1.0153697E 00 | 1.0155097E 00 | 1.0156458E 00 | 1.0157768E 00 | DATA 254 |
| 267 | 275                         | 1.0159031E 00 | 1.0160240E 00 | 1.0161391E 00 | 1.0162485E 00 | DATA 255 |
| 268 | 276                         | 1.0163520E 00 | 1.0164495E 00 | 1.0165411E 00 | 1.0166268E 00 | DATA 256 |
| 269 | 277                         | 1.0167048E 00 | 1.0167814E 00 | 1.0168508E 00 | 1.0169151E 00 | DATA 257 |
| 270 | 278                         | 1.0169746E 00 | 1.0170296E 00 | 1.0170802E 00 | 1.0171266E 00 | DATA 258 |
| 271 | 279                         | 1.0171691E 00 | 1.0172079E 00 | 1.0172431E 00 | 1.0172748E 00 | DATA 259 |
| 272 | DATA (RSUN (1)) : 181.2161/ |               |               |               |               | DATA 260 |
| 273 | 281                         | 1.0173031E 00 | 1.0173280E 00 | 1.0173496E 00 | 1.0173676E 00 | DATA 261 |
| 274 | 282                         | 1.0173819E 00 | 1.0173920E 00 | 1.0173979E 00 | 1.0173990E 00 | DATA 262 |
| 275 | 283                         | 1.0173952E 00 | 1.0173860E 00 | 1.0173711E 00 | 1.0173503E 00 | DATA 263 |
| 276 | 284                         | 1.0173235E 00 | 1.0172906E 00 | 1.0172513E 00 | 1.0172062E 00 | DATA 264 |
| 277 | 285                         | 1.0171550E 00 | 1.0170980E 00 | 1.0170333E 00 | 1.0169671E 00 | DATA 265 |
| 278 | 286                         | 1.0168938E 00 | 1.0168155E 00 | 1.0167325E 00 | 1.0166451E 00 | DATA 266 |
| 279 | 287                         | 1.0165535E 00 | 1.0164580E 00 | 1.0163589E 00 | 1.0162564E 00 | DATA 267 |
| 280 | 288                         | 1.0161507E 00 | 1.0160420E 00 | 1.0159303E 00 | 1.0158160E 00 | DATA 268 |
| 281 | 289                         | 1.0156964E 00 | 1.0155775E 00 | 1.0154532E 00 | 1.0153253E 00 | DATA 269 |
| 282 | DATA (RSUN (1)) : 217.2521/ |               |               |               |               | DATA 270 |
| 283 | 291                         | 1.0151933E 00 | 1.0150569E 00 | 1.0149158E 00 | 1.0147699E 00 | DATA 271 |
| 284 | 292                         | 1.0146189E 00 | 1.0144628E 00 | 1.0143013E 00 | 1.0141345E 00 | DATA 272 |
| 285 | 293                         | 1.0139626E 00 | 1.0137854E 00 | 1.0136036E 00 | 1.0134169E 00 | DATA 273 |
| 286 | 294                         | 1.0132255E 00 | 1.0130299E 00 | 1.0128302E 00 | 1.0126267E 00 | DATA 274 |
| 287 | 295                         | 1.0124197E 00 | 1.0122096E 00 | 1.0119966E 00 | 1.0117811E 00 | DATA 275 |
| 288 | 296                         | 1.0115634E 00 | 1.0113438E 00 | 1.0111228E 00 | 1.0109001E 00 | DATA 276 |
| 289 | 297                         | 1.0106758E 00 | 1.0104499E 00 | 1.0102225E 00 | 1.0099933E 00 | DATA 277 |
| 290 | 298                         | 1.0097618E 00 | 1.0095279E 00 | 1.0092912E 00 | 1.0090516E 00 | DATA 278 |
| 291 | 299                         | 1.0088009E 00 | 1.0085630E 00 | 1.0083136E 00 | 1.0080607E 00 | DATA 279 |
| 292 | DATA (RSUN (1)) : 253.2881/ |               |               |               |               | DATA 280 |
| 293 | 301                         | 1.0078044E 00 | 1.0075447E 00 | 1.0072817E 00 | 1.0070155E 00 | DATA 281 |
| 294 | 302                         | 1.0067464E 00 | 1.0064744E 00 | 1.0061998E 00 | 1.0059230E 00 | DATA 282 |
| 295 | 303                         | 1.0056441E 00 | 1.0053637E 00 | 1.0050817E 00 | 1.0047980E 00 | DATA 283 |
| 296 | 304                         | 1.0045154E 00 | 1.0042318E 00 | 1.0039465E 00 | 1.0036654E 00 | DATA 284 |
| 297 | 305                         | 1.0033829E 00 | 1.0031010E 00 | 1.0028201E 00 | 1.0025396E 00 | DATA 285 |
| 298 | 306                         | 1.0022396E 00 | 1.0019796E 00 | 1.0016995E 00 | 1.0014191E 00 | DATA 286 |
| 299 | 307                         | 1.0011382E 00 | 1.0008566E 00 | 1.0005740E 00 | 1.0002905E 00 | DATA 287 |
| 300 | 308                         | 1.0000040E 00 | 9.9972054E-01 | 9.9943402E-01 | 9.9914657E-01 | DATA 288 |
| 301 | 309                         | 9.9889330E-01 | 9.9858934E-01 | 9.9827984E-01 | 9.9796906E-01 | DATA 289 |
| 302 | DATA (RSUN (1)) : 289.3241/ |               |               |               |               | DATA 290 |
| 303 | 311                         | 9.9770026E-01 | 9.9741074E-01 | 9.9712166E-01 | 9.9683356E-01 | DATA 291 |
| 304 | 312                         | 9.9684692E-01 | 9.9656183E-01 | 9.9627701E-01 | 9.9599864E-01 | DATA 292 |
| 305 | 313                         | 9.9542101E-01 | 9.9514635E-01 | 9.9487313E-01 | 9.9460702E-01 | DATA 293 |
| 306 | 314                         | 9.9434194E-01 | 9.9407973E-01 | 9.9382025E-01 | 9.9356326E-01 | DATA 294 |

|     |     |                            |                |                 |                 |          |
|-----|-----|----------------------------|----------------|-----------------|-----------------|----------|
| 807 | 315 | 9.9330857E-01,             | 9.9305598E-01, | 9.928518E-01,   | 9.9255612E-01,  | DATA 295 |
| 808 | 316 | 9.9230869E-01,             | 9.9206282E-01, | 9.9181841E-01,  | 9.9157546E-01,  | DATA 296 |
| 809 | 317 | 9.9133400E-01,             | 9.9109408E-01, | 9.9085372E-01,  | 9.9061915E-01,  | DATA 297 |
| 810 | 318 | 9.9038453E-01,             | 9.9015206E-01, | 9.8992191E-01,  | 9.8969451E-01,  | DATA 298 |
| 811 | 319 | 9.8947021E-01,             | 9.8924942E-01, | 9.8903243E-01,  | 9.8881966E-01,  | DATA 299 |
| 812 |     | DATA (RSUN (1))=325.360,/  |                |                 |                 | DATA 300 |
| 813 | 321 | 9.8861146E-01,             | 9.8840816E-01, | 9.8821025E-01,  | 9.8801757E-01,  | DATA 301 |
| 814 | 322 | 9.8763012E-01,             | 9.8747484E-01, | 9.8747072E-01,  | 9.8729855E-01,  | DATA 302 |
| 815 | 323 | 9.8713107E-01,             | 9.8696807E-01, | 9.8680922E-01,  | 9.8665443E-01,  | DATA 303 |
| 816 | 324 | 9.8650351E-01,             | 9.8635630E-01, | 9.8621263E-01,  | 9.8607241E-01,  | DATA 304 |
| 817 | 325 | 9.8593555E-01,             | 9.8580196E-01, | 9.8567161E-01,  | 9.8554455E-01,  | DATA 305 |
| 818 | 326 | 9.8542086E-01,             | 9.8530067E-01, | 9.8518396E-01,  | 9.8507113E-01,  | DATA 306 |
| 819 | 327 | 9.8496268E-01,             | 9.8485629E-01, | 9.8475882E-01,  | 9.8466451E-01,  | DATA 307 |
| 820 | 328 | 9.8457570E-01,             | 9.8449272E-01, | 9.8441608E-01,  | 9.8434570E-01,  | DATA 308 |
| 821 | 329 | 9.8428171E-01,             | 9.8422412E-01, | 9.8417319E-01,  | 9.8412833E-01,  | DATA 309 |
| 822 |     | DATA (RSUN (1))=361.360,/  |                |                 |                 | DATA 310 |
| 823 | 331 | 9.8408967E-01,             | 9.8405686E-01, | 9.8402964E-01,  | 9.8400781E-01,  | DATA 311 |
| 824 | 332 | 9.8399117E-01,             | 9.8397945E-01, | 9.8397244E-01,  | 9.8396991E-01,  | DATA 312 |
| 825 |     | DATA (RAMOON(1))=37.36,/   |                |                 |                 | DATA 312 |
| 826 | 341 | 1.2034019E-00,             | 1.4450900E-00, | 1.6859133E-00,  | 1.9226973E-00,  | DATA 313 |
| 827 | 342 | 2.1826698E-00,             | 2.3741679E-00, | 2.5869114E-00,  | 2.7918067E-00,  | DATA 314 |
| 828 | 343 | 2.9910392E-00,             | 3.1869549E-00, | 3.3826104E-00,  | 3.5811913E-00,  | DATA 315 |
| 829 | 344 | 3.7359192E-00,             | 3.9998077E-00, | 4.2252609E-00,  | 4.4634818E-00,  | DATA 316 |
| 830 | 345 | 4.7132012E-00,             | 4.9733418E-00, | 5.2373462E-00,  | 5.5065286E-00,  | DATA 317 |
| 831 | 346 | 5.7386334E-00,             | 6.0094737E-00, | 6.2530233E-00,  | 6.474638E-01,   | DATA 318 |
| 832 | 347 | 4.4804302E-01,             | 6.7540625E-01, | 9.0957569E-01,  | 1.1454140E-00,  | DATA 319 |
| 833 | 348 | 1.3025647E-00,             | 1.6195010E-00, | 1.8539283E-00,  | 2.0834303E-00,  | DATA 320 |
| 834 | 349 | 2.3061439E-00,             | 2.5211913E-00, | 2.7287944E-00,  | 2.9301423E-00,  | DATA 321 |
| 835 |     | DATA (RAMOON(1))=37.72,/   |                |                 |                 | DATA 322 |
| 836 | 351 | 3.1271577E-00,             | 3.3222669E-00, | 3.5182181E-00,  | 3.7179327E-00,  | DATA 323 |
| 837 | 352 | 3.9243406E-00,             | 4.1401308E-00, | 4.3673569E-00,  | 4.6068924E-00,  | DATA 324 |
| 838 | 353 | 4.6878799E-00,             | 5.1175082E-00, | 5.6814833E-00,  | 5.4451999E-00,  | DATA 325 |
| 839 | 354 | 5.9050665E-00,             | 6.1592894E-00, | 1.2466844E-01,  | 3.6876634E-01,  | DATA 326 |
| 840 | 355 | 6.1005447E-01,             | 8.4999383E-01, | 1.0893730E-00,  | 1.3280631E-00,  | DATA 327 |
| 841 | 356 | 1.5650430E-00,             | 1.7986977E-00, | 2.0727887E-00,  | 2.4645822E-00,  | DATA 328 |
| 842 | 357 | 2.6828301E-00,             | 2.8751641E-00, | 3.0731470E-00,  | 3.2687749E-00,  | DATA 329 |
| 843 | 358 | 3.4643271E-00,             | 3.6622390E-00, | 3.8649752E-00,  | 4.0748594E-00,  | DATA 330 |
| 844 | 359 | 4.2938255E-00,             | 4.5230758E-00, | 4.7626932E-00,  | 5.0113927E-00,  | DATA 331 |
| 845 |     | DATA (RAMOON(1))=73.108,/  |                |                 |                 | DATA 332 |
| 846 | 361 | 5.2666133E-00,             | 5.5250941E-00, | 5.7837616E-00,  | 6.0405191E-00,  | DATA 333 |
| 847 | 362 | 1.1378558E-02,             | 2.6299560E-01, | 5.1300663E-01,  | 7.6213831E-01,  | DATA 334 |
| 848 | 363 | 1.0104988E-00,             | 1.2573450E-00, | 1.5011662E-00,  | 1.7400872E-00,  | DATA 335 |
| 849 | 364 | 1.9722816E-00,             | 2.1967168E-00, | 2.4130907E-00,  | 2.6219781E-00,  | DATA 336 |
| 850 | 365 | 2.8246453E-00,             | 3.0228475E-00, | 3.2186447E-00,  | 3.4142854E-00,  | DATA 337 |
| 851 | 366 | 3.6119387E-00,             | 3.8138749E-00, | 4.0220179E-00,  | 4.2378944E-00,  | DATA 338 |
| 852 | 367 | 4.4623585E-00,             | 4.6953561E-00, | 4.9338176E-00,  | 5.1818092E-00,  | DATA 339 |
| 853 | 368 | 5.4309906E-00,             | 5.6812506E-00, | 5.9312620E-00,  | 6.1860783E-00,  | DATA 340 |
| 854 | 369 | 1.4703169E-01,             | 3.9756894E-01, | 6.4997207E-01,  | 9.0425859E-01,  | DATA 341 |
| 855 |     | DATA (RAMOON(1))=109.144,/ |                |                 |                 | DATA 342 |
| 856 | 371 | 1.1992419E-00,             | 1.4125588E-00, | 1.6511992E-00,  | 1.9023893E-00,  | DATA 343 |
| 857 | 372 | 2.1340874E-00,             | 2.3558420E-00, | 2.5882347E-00,  | 2.82728823E-00, | DATA 344 |
| 858 | 373 | 2.9717923E-00,             | 3.1675802E-00, | 3.3627711E-00,  | 3.5590049E-00,  | DATA 345 |
| 859 | 374 | 3.7613519E-00,             | 3.9691443E-00, | 4.1847501E-00,  | 4.4088093E-00,  | DATA 346 |
| 860 | 375 | 4.6409063E-00,             | 4.8755294E-00, | 5.1223465E-00,  | 5.3667982E-00,  | DATA 347 |
| 861 | 376 | 5.6106137E-00,             | 5.8533567E-00, | 6.0946100E-00,  | 5.2667036E-02,  | DATA 348 |
| 862 | 377 | 2.9352313E-01,             | 5.4194961E-01, | 7.9293516E-01,  | 1.0481476E-00,  | DATA 349 |
| 863 | 378 | 1.3055230E-00,             | 1.5615172E-00, | 1.8120213E-00,  | 2.0535591E-00,  | DATA 350 |
| 864 | 379 | 2.2841600E-00,             | 2.5036047E-00, | 2.7131301E-00,  | 2.9149501E-00,  | DATA 351 |
| 865 |     | DATA (RAMOON(1))=149.180,/ |                |                 |                 | DATA 352 |
| 866 | 381 | 3.1818138E-00,             | 3.3066947E-00, | 3.5025882E-00,  | 3.7023538E-00,  | DATA 353 |
| 867 | 382 | 3.9085337E-00,             | 4.1230927E-00, | 4.3470728E-00,  | 4.5802388E-00,  | DATA 354 |
| 868 | 383 | 4.6809020E-00,             | 5.0661532E-00, | 5.3125796E-00,  | 5.5972351E-00,  | DATA 355 |
| 869 | 384 | 5.7684313E-00,             | 6.0360481E-00, | 6.2713594E-00,  | 2.2337527E-01,  | DATA 356 |
| 870 | 385 | 4.6097847E-01,             | 7.0314071E-01, | 9.5095699E-01,  | 1.2038365E-00,  | DATA 357 |
| 871 | 386 | 1.4892506E-00,             | 1.7131669E-00, | 1.9611655E-00,  | 2.1997383E-00,  | DATA 358 |
| 872 | 387 | 2.4271214E-00,             | 2.6434088E-00, | 2.8901638E-00,  | 3.0498903E-00,  | DATA 359 |
| 873 | 388 | 3.2459299E-00,             | 3.4404813E-00, | 3.6377759E-00,  | 3.8463335E-00,  | DATA 360 |
| 874 | 389 | 4.0814120E-00,             | 4.2723144E-00, | 4.47039246E-00, | 4.7452793E-00,  | DATA 361 |
| 875 |     | DATA (RAMOON(1))=181.210,/ |                |                 |                 | DATA 362 |
| 876 | 391 | 4.9936730E-00,             | 5.2451769E-00, | 5.4957262E-00,  | 5.7423014E-00,  | DATA 363 |
| 877 | 392 | 5.9636373E-00,             | 6.2202597E-00, | 1.9085464E-01,  | 4.8436910E-01,  | DATA 364 |
| 878 | 393 | 6.4022870E-01,             | 8.8041467E-01, | 1.1255462E-00,  | 1.3749198E-00,  | DATA 365 |
| 879 | 394 | 1.6254857E-00,             | 1.0734650E-00, | 2.3149610E-00,  | 2.3471818E-00,  | DATA 366 |



|     |                             |                 |                 |                 |                 |          |
|-----|-----------------------------|-----------------|-----------------|-----------------|-----------------|----------|
| 880 | 395                         | 2.5688750E 00,  | 2.7806062E 00,  | 2.9840749E 00,  | 3.1818113E 00,  | DATA 367 |
| 881 | 396                         | 3.3767845E 00,  | 3.5721588E 00,  | 3.7711184E 00,  | 3.9768816E 00,  | DATA 368 |
| 882 | 397                         | 4.1814279E 00,  | 4.470838E 00,   | 4.6540076E 00,  | 4.9067670E 00,  | DATA 369 |
| 883 | 398                         | 5.1941554E 00,  | 5.4099034E 00,  | 5.6639146E 00,  | 5.9134279E 00,  | DATA 370 |
| 884 | 399                         | 5.1975569E 00,  | 5.4394020E 01,  | 5.5089558E 01,  | 5.8759948E 01,  | DATA 371 |
| 885 | DATA (RAMOON1),I:217,252, / |                 |                 |                 |                 | DATA 372 |
| 886 | 401                         | 8.2614824E 01,  | 1.0677697E 00,  | 1.8123658E 00,  | 1.5583509E 00,  | DATA 373 |
| 887 | 402                         | 1.8029492E 00,  | 2.0429397E 00,  | 2.2755449E 00,  | 2.4922103E 00,  | DATA 374 |
| 888 | 403                         | 2.7136348E 00,  | 2.9198178E 00,  | 3.1196315E 00,  | 3.3155137E 00,  | DATA 375 |
| 889 | 404                         | 3.5302179E 00,  | 3.7066351E 00,  | 3.9076419E 00,  | 4.1159112E 00,  | DATA 376 |
| 890 | 405                         | 4.3336279E 00,  | 4.5620884E 00,  | 4.8012944E 00,  | 5.0494711E 00,  | DATA 377 |
| 891 | 406                         | 5.3036381E 00,  | 5.5599682E 00,  | 5.8150808E 00,  | 6.0668983E 00,  | DATA 378 |
| 892 | 407                         | 3.1767712E 02,  | 2.7691761E 01,  | 5.2073021E 01,  | 7.6478494E 01,  | DATA 379 |
| 893 | 408                         | 1.0100500E 00,  | 1.2564422E 00,  | 1.5026869E 00,  | 1.7465670E 00,  | DATA 380 |
| 894 | 409                         | 1.9855176E 00,  | 2.2173367E 00,  | 2.4407231E 00,  | 2.6554803E 00,  | DATA 381 |
| 895 | DATA (RAMOON1),I:253,288, / |                 |                 |                 |                 | DATA 382 |
| 896 | 411                         | 2.8624215E 00,  | 3.0631237E 00,  | 3.2596626E 00,  | 3.4543986E 00,  | DATA 383 |
| 897 | 412                         | 3.6498163E 00,  | 3.8484063E 00,  | 4.0525052E 00,  | 4.2641856E 00,  | DATA 384 |
| 898 | 413                         | 4.4846850E 00,  | 4.7147037E 00,  | 4.9535637E 00,  | 5.1995004E 00,  | DATA 385 |
| 899 | 414                         | 5.4499661E 00,  | 5.7023214E 00,  | 5.9545786E 00,  | 6.2058855E 00,  | DATA 386 |
| 900 | 415                         | 1.7320503E 01,  | 4.23919.3E 01,  | 6.7581318E 01,  | 9.2929073E 01,  | DATA 387 |
| 901 | 416                         | 1.1836747E 00,  | 1.4370926E 00,  | 1.6868399E 00,  | 1.9331066E 00,  | DATA 388 |
| 902 | 417                         | 2.1447395E 00,  | 2.3897145E 00,  | 2.6052088E 00,  | 2.8123851E 00,  | DATA 389 |
| 903 | 418                         | 3.0130742E 00,  | 3.2094842E 00,  | 3.4039858E 00,  | 3.5989624E 00,  | DATA 390 |
| 904 | 419                         | 3.7966914E 00,  | 3.9992202E 00,  | 4.2082100E 00,  | 4.4247431E 00,  | DATA 391 |
| 905 | DATA (RAMOON1),I:289,324, / |                 |                 |                 |                 | DATA 392 |
| 906 | 421                         | 4.6491288E 00,  | 4.8007908E 00,  | 5.1183435E 00,  | 5.3599213E 00,  | DATA 393 |
| 907 | 422                         | 5.6037051E 00,  | 5.8484625E 00,  | 6.0938889E 00,  | 6.3439789E 02,  | DATA 394 |
| 908 | 423                         | 3.0475981E 01,  | 5.5999369E 01,  | 8.1779092E 01,  | 1.8794193E 00,  | DATA 395 |
| 909 | 424                         | 1.3624215E 00,  | 1.6029521E 00,  | 1.8567964E 00,  | 2.1065902E 00,  | DATA 396 |
| 910 | 425                         | 2.3326142E 00,  | 2.5529041E 00,  | 2.7628735E 00,  | 2.9647924E 00,  | DATA 397 |
| 911 | 426                         | 3.1613471E 00,  | 3.3853409E 00,  | 3.5495095E 00,  | 3.7463849E 00,  | DATA 398 |
| 912 | 427                         | 3.9481563E 00,  | 4.1564926E 00,  | 4.3723276E 00,  | 4.5958623E 00,  | DATA 399 |
| 913 | 428                         | 4.8254936E 00,  | 5.0599897E 00,  | 5.2969525E 00,  | 5.5344483E 00,  | DATA 400 |
| 914 | 429                         | 5.7713776E 00,  | 6.0077844E 00,  | 6.2448392E 00,  | 6.4835789E 01,  | DATA 401 |
| 915 | DATA (RAMOON1),I:325,360, / |                 |                 |                 |                 | DATA 402 |
| 916 | 431                         | 4.4602764E 01,  | 6.9758309E 01,  | 9.5668053E 01,  | 1.2219066E 00,  | DATA 403 |
| 917 | 432                         | 1.4895051E 00,  | 1.7541022E 00,  | 2.0103089E 00,  | 2.2543340E 00,  | DATA 404 |
| 918 | 433                         | 2.4447470E 00,  | 2.7022762E 00,  | 2.9091205E 00,  | 3.1082556E 00,  | DATA 405 |
| 919 | 434                         | 3.3029441E 00,  | 3.4964454E 00,  | 3.6918391E 00,  | 3.8913709E 00,  | DATA 406 |
| 920 | 435                         | 4.0987526E 00,  | 4.3138880E 00,  | 4.5375658E 00,  | 4.7687550E 00,  | DATA 407 |
| 921 | 436                         | 5.0051974E 00,  | 5.2439252E 00,  | 5.4820929E 00,  | 5.7177959E 00,  | DATA 408 |
| 922 | 437                         | 5.9505491E 00,  | 6.1813245E 00,  | 1.2907021E 01,  | 3.6297045E 01,  | DATA 409 |
| 923 | 438                         | 6.0272591E 01,  | 8.5053887E 01,  | 1.1070348E 00,  | 1.3704709E 00,  | DATA 410 |
| 924 | 439                         | 1.6365775E 00,  | 1.8995069E 00,  | 2.1536439E 00,  | 2.3952682E 00,  | DATA 411 |
| 925 | DATA (RAMOON1),I:361,368, / |                 |                 |                 |                 | DATA 412 |
| 926 | 441                         | 2.6232069E 00,  | 2.8384908E 00,  | 3.0435872E 00,  | 3.2416928E 00,  | DATA 413 |
| 927 | 442                         | 3.4362612E 00,  | 3.6307298E 00,  | 3.8283423E 00,  | 4.0319654E 00,  | DATA 414 |
| 928 | DATA (RAMOON1),I:361,368, / |                 |                 |                 |                 | DATA 414 |
| 929 | 451                         | 2.9561453E 01,  | 3.2380723E 01,  | 3.5422747E 01,  | 3.2704121E 01,  | DATA 415 |
| 930 | 452                         | 3.0366341E 01,  | 2.6639482E 01,  | 2.1795955E 01,  | 1.6111394E 01,  | DATA 416 |
| 931 | 453                         | 9.8418921E 02,  | 3.2183734E 02,  | 5.5458678E 02,  | 8.1823914E 01,  | DATA 417 |
| 932 | 454                         | -1.6630999E 01, | -2.2452109E 01, | -2.7381255E 01, | -3.1050301E 01, | DATA 418 |
| 933 | 455                         | -3.3679984E 01, | -3.3152093E 01, | -3.1101553E 01, | -2.6986930E 01, | DATA 419 |
| 934 | 456                         | -2.1098330E 01, | -1.3898027E 01, | -5.9290614E 02, | 2.2684420E 02,  | DATA 420 |
| 935 | 457                         | 1.0190491E 01,  | 1.7417131E 01,  | 2.8584270E 01,  | 2.8399128E 01,  | DATA 421 |
| 936 | 458                         | 3.1444928E 01,  | 3.3195697E 01,  | 3.8030066E 01,  | 3.1233885E 01,  | DATA 422 |
| 937 | 459                         | 2.7981742E 01,  | 2.3513674E 01,  | 1.8096031E 01,  | 1.8997326E 01,  | DATA 423 |
| 938 | DATA (RAMOON1),I:37,72, /   |                 |                 |                 |                 | DATA 424 |
| 939 | 461                         | 5.4716952E 02,  | -1.2452921E 02, | -7.9310874E 02, | -1.4343804E 01, | DATA 425 |
| 940 | 462                         | -2.0306135E 01, | -2.5489629E 01, | -2.9605885E 01, | -3.2314524E 01, | DATA 426 |
| 941 | 463                         | -3.3279098E 01, | -3.2234980E 01, | -2.9074314E 01, | -2.8913051E 01, | DATA 427 |
| 942 | 464                         | -1.7096382E 01, | -9.1547945E 02, | -7.0147119E 03, | 7.65582104E 02, | DATA 428 |
| 943 | 465                         | 1.5378127E 01,  | 2.2033776E 01,  | 2.7300693E 01,  | 3.8967038E 01,  | DATA 429 |
| 944 | 466                         | 3.2925906E 01,  | 3.3169814E 01,  | 3.3781373E 01,  | 2.4789062E 01,  | DATA 430 |
| 945 | 467                         | 1.9437744E 01,  | 1.3718277E 01,  | 7.2649324E 02,  | 5.8504837E 03,  | DATA 431 |
| 946 | 468                         | -6.1417454E 02, | -1.2659440E 01, | -1.8728297E 01, | -2.4096094E 01, | DATA 432 |
| 947 | 469                         | -2.8491532E 01, | -3.1625246E 01, | -3.3205334E 01, | -3.2973142E 01, | DATA 433 |
| 948 | DATA (RAMOON1),I:73,108, /  |                 |                 |                 |                 | DATA 434 |
| 949 | 471                         | -3.0758103E 01, | -2.6538850E 01, | -2.0488218E 01, | -1.2981501E 01, | DATA 435 |
| 950 | 472                         | -4.5603610E 02, | 4.1388646E 02,  | 1.2472088E 01,  | 1.9846689E 01,  | DATA 436 |
| 951 | 473                         | 2.5876675E 01,  | 3.0209115E 01,  | 3.2729231E 01,  | 3.8423090E 01,  | DATA 437 |
| 952 | 474                         | 3.2408427E 01,  | 2.9860682E 01,  | 2.5001403E 01,  | 2.3070843E 01,  | DATA 438 |



|     |     |                                |                 |                 |                 |          |
|-----|-----|--------------------------------|-----------------|-----------------|-----------------|----------|
| 453 | 475 | 1.5311191E-01,                 | 8.9656836E-02,  | 2.2734718E-02,  | 4.5249810E-02,  | DATA 439 |
| 454 | 476 | -1.1184911E-01,                | -1.7431660E-01, | -2.8062342E-01, | -2.2743820E-01, | DATA 440 |
| 455 | 477 | -3.1219334E-01,                | -3.3225226E-01, | -3.3535283E-01, | -3.1994108E-01, | DATA 441 |
| 456 | 478 | -2.8836094E-01,                | -2.8308986E-01, | -1.6496138E-01, | -2.5123563E-02, | DATA 442 |
| 457 | 479 | 1.1671416E-03,                 | 8.7705264E-02,  | 1.6839193E-01,  | 2.872151E-01,   | DATA 443 |
| 458 |     | DATA (BCMOON(I), I)=101891144, |                 |                 |                 | DATA 444 |
| 459 | 481 | 2.8978460E-01,                 | 3.2342091E-01,  | 3.5705878E-01,  | 3.5248189E-01,  | DATA 445 |
| 460 | 482 | 3.1080820E-01,                 | 2.7492812E-01,  | 2.2756734E-01,  | 1.7134384E-01,  | DATA 446 |
| 461 | 483 | 1.0869933E-01,                 | 4.1944621E-02,  | -2.6439882E-02, | -9.4693611E-02, | DATA 447 |
| 462 | 484 | -1.5968748E-01,                | -2.1888333E-01, | -2.8936538E-01, | -3.8816740E-01, | DATA 448 |
| 463 | 485 | -3.3250682E-01,                | -3.4010509E-01, | -3.2952793E-01, | -3.8044883E-01, | DATA 449 |
| 464 | 486 | -2.5376579E-01,                | -1.9137479E-01, | -1.1706825E-01, | -3.4420894E-02, | DATA 450 |
| 465 | 487 | 5.1345397E-02,                 | 1.3459515E-01,  | 2.8950655E-01,  | 2.7071986E-01,  | DATA 451 |
| 466 | 488 | 3.1609955E-01,                 | 3.3736300E-01,  | 3.4030248E-01,  | 3.2449101E-01,  | DATA 452 |
| 467 | 489 | 2.9263049E-01,                 | 2.4785261E-01,  | 1.9321723E-01,  | 1.8148082E-01,  | DATA 453 |
| 468 |     | DATA (BCMOON(I), I)=149,180,   |                 |                 |                 | DATA 454 |
| 469 | 491 | 6.5083017E-02,                 | -3.7384405E-03, | -7.2778611E-02, | -1.3969418E-01, | DATA 455 |
| 470 | 492 | -2.0187122E-01,                | -2.5637502E-01, | -3.8003178E-01, | -3.2968230E-01, | DATA 456 |
| 471 | 493 | -3.4260333E-01,                | -3.3700110E-01, | -3.3240272E-01, | -2.6978572E-01, | DATA 457 |
| 472 | 494 | -2.1442205E-01,                | -1.4056519E-01, | -6.1191888E-02, | -2.2388034E-02, | DATA 458 |
| 473 | 495 | 1.0923786E-01,                 | 1.8322200E-01,  | 2.4838384E-01,  | 2.9948363E-01,  | DATA 459 |
| 474 | 496 | 3.3166223E-01,                 | 3.4352918E-01,  | 3.3547568E-01,  | 3.8956822E-01,  | DATA 460 |
| 475 | 497 | 2.6888038E-01,                 | 2.1679009E-01,  | 1.5649197E-01,  | 9.8791336E-02,  | DATA 461 |
| 476 | 498 | 2.2119292E-02,                 | -4.7322544E-02, | -4.1536210E-01, | -1.7965389E-01, | DATA 462 |
| 477 | 499 | -2.3751988E-01,                | -2.8589405E-01, | -3.2144396E-01, | -3.4094651E-01, | DATA 463 |
| 478 |     | DATA (BCMOON(I), I)=181,216,   |                 |                 |                 | DATA 464 |
| 479 | 501 | -3.4185436E-01,                | -3.2295128E-01, | -2.8474936E-01, | -2.2947155E-01, | DATA 465 |
| 480 | 502 | -1.6065252E-01,                | -8.2598754E-02, | 5.8986326E-05,  | 8.2613407E-02,  | DATA 466 |
| 481 | 503 | 1.6041755E-01,                 | 2.2896150E-01,  | 2.8408507E-01,  | 3.2235179E-01,  | DATA 467 |
| 482 | 504 | 3.4153794E-01,                 | 3.4103238E-01,  | 3.2190990E-01,  | 2.8639849E-01,  | DATA 468 |
| 483 | 505 | 2.3827941E-01,                 | 1.8032265E-01,  | 1.1587306E-01,  | 4.7700016E-02,  | DATA 469 |
| 484 | 506 | -2.1779161E-02,                | -9.0360178E-02, | -1.5585920E-01, | -2.1591368E-01, | DATA 470 |
| 485 | 507 | -2.6782637E-01,                | -3.0832145E-01, | -3.3470231E-01, | -3.6328503E-01, | DATA 471 |
| 486 | 508 | -3.3206964E-01,                | -3.0044303E-01, | -2.4977987E-01, | -1.8333516E-01, | DATA 472 |
| 487 | 509 | -1.0870293E-01,                | -2.2123013E-02, | 6.2101129E-02,  | 1.4196487E-01,  | DATA 473 |
| 488 |     | DATA (BCMOON(I), I)=217,252,   |                 |                 |                 | DATA 474 |
| 489 | 511 | 2.1294565E-01,                 | 2.7112290E-01,  | 3.3333954E-01,  | 3.3744970E-01,  | DATA 475 |
| 490 | 512 | 3.4257494E-01,                 | 3.2922783E-01,  | 2.9918578E-01,  | 2.5513221E-01,  | DATA 476 |
| 491 | 513 | 2.0019973E-01,                 | 1.3757067E-01,  | 7.0223604E-02,  | 8.3717790E-04,  | DATA 477 |
| 492 | 514 | -6.8180372E-02,                | -1.3457957E-01, | -1.9611601E-01, | -2.5039265E-01, | DATA 478 |
| 493 | 515 | -2.2474582E-01,                | -3.2624239E-01, | -3.4186972E-01, | -3.3897441E-01, | DATA 479 |
| 494 | 516 | -3.1390451E-01,                | -2.7265758E-01, | -2.1125168E-01, | -1.8563195E-01, | DATA 480 |
| 495 | 517 | -5.1147354E-02,                | 3.6189859E-02,  | 1.2042027E-01,  | 1.9617836E-01,  | DATA 481 |
| 496 | 518 | 2.5903201E-01,                 | 3.0567491E-01,  | 3.3407047E-01,  | 3.4346638E-01,  | DATA 482 |
| 497 | 519 | 3.3439690E-01,                 | 3.0847697E-01,  | 2.6810508E-01,  | 2.1612164E-01,  | DATA 483 |
| 498 |     | DATA (BCMOON(I), I)=253,288,   |                 |                 |                 | DATA 484 |
| 499 | 521 | 1.5821277E-01,                 | 8.9206168E-02,  | 1.9965439E-02,  | 4.9633092E-02,  | DATA 485 |
| 500 | 522 | -1.1716705E-01,                | -1.8029170E-01, | -2.8664928E-01, | -2.8378722E-01, | DATA 486 |
| 501 | 523 | -3.1912773E-01,                | -3.4003750E-01, | -3.4404938E-01, | -3.2924945E-01, | DATA 487 |
| 502 | 524 | -2.9477379E-01,                | -2.411801E-01,  | -1.9123354E-01, | -8.8888621E-02, | DATA 488 |
| 503 | 525 | 6.3446784E-05,                 | 8.9128503E-02,  | 1.9179449E-01,  | 2.4230092E-01,  | DATA 489 |
| 504 | 526 | 2.9624553E-01,                 | 3.3094046E-01,  | 3.4548419E-01,  | 3.4056180E-01,  | DATA 490 |
| 505 | 527 | 3.1804396E-01,                 | 2.8051397E-01,  | 2.3085585E-01,  | 1.7198028E-01,  | DATA 491 |
| 506 | 528 | 1.0669181E-01,                 | 3.7658089E-02,  | -3.2564709E-02, | -1.8148819E-01, | DATA 492 |
| 507 | 529 | -1.6662953E-01,                | -2.2550594E-01, | -2.9559241E-01, | -3.1436528E-01, | DATA 493 |
| 508 |     | DATA (BCMOON(I), I)=289,324,   |                 |                 |                 | DATA 494 |
| 509 | 531 | -3.3938902E-01,                | -3.4848351E-01, | -3.3996460E-01, | -3.1292672E-01, | DATA 495 |
| 510 | 532 | -2.6751737E-01,                | -2.0515908E-01, | -1.2869338E-01, | -4.2416071E-02, | DATA 496 |
| 511 | 533 | 4.8061711E-02,                 | 1.3621482E-01,  | 2.3530903E-01,  | 2.7932552E-01,  | DATA 497 |
| 512 | 534 | 3.2387679E-01,                 | 3.4680948E-01,  | 3.4826648E-01,  | 3.8021015E-01,  | DATA 498 |
| 513 | 535 | 2.9866086E-01,                 | 2.4798173E-01,  | 1.041548E-01,   | 1.2589772E-01,  | DATA 499 |
| 514 | 536 | 5.7065290E-02,                 | -1.3638226E-02, | -8.3831291E-02, | -1.5108170E-01, | DATA 500 |
| 515 | 537 | -2.1283916E-01,                | -2.6643229E-01, | -3.0914647E-01, | -3.8839020E-01, | DATA 501 |
| 516 | 538 | -3.5193830E-01,                | -3.4820431E-01, | -3.2647101E-01, | -2.8701866E-01, | DATA 502 |
| 517 | 539 | -2.3114667E-01,                | -1.6114403E-01, | -8.0280327E-02, | 7.1644436E-03,  | DATA 503 |
| 518 |     | DATA (BCMOON(I), I)=325,360,   |                 |                 |                 | DATA 504 |
| 519 | 541 | 9.5901945E-02,                 | 1.7981830E-01,  | 2.5249282E-01,  | 3.6809601E-01,  | DATA 505 |
| 520 | 542 | 3.4247005E-01,                 | 3.3394706E-01,  | 3.4346442E-01,  | 3.3391696E-01,  | DATA 506 |
| 521 | 543 | 2.6914469E-01,                 | 2.1305797E-01,  | 1.4915227E-01,  | 8.9387096E-02,  | DATA 507 |
| 522 | 544 | 9.2873630E-03,                 | -6.1861670E-02, | -1.3030854E-01, | -1.9516717E-01, | DATA 508 |
| 523 | 545 | -2.5237255E-01,                | -2.9944769E-01, | -3.8366511E-01, | -3.9235956E-01, | DATA 509 |
| 524 | 546 | -3.5358541E-01,                | -3.3643894E-01, | -3.0125069E-01, | -2.4953606E-01, | DATA 510 |
| 525 | 547 | -1.8377669E-01,                | -1.0718173E-01, | -2.3548424E-02, | 6.2759209E-02,  | DATA 511 |
| 526 | 548 | 1.4676416E-01,                 | 2.2300011E-01,  | 2.8584116E-01,  | 3.8027415E-01,  | DATA 512 |

|     |     |                               |                 |                 |                 |      |     |   |
|-----|-----|-------------------------------|-----------------|-----------------|-----------------|------|-----|---|
| 927 | 549 | 3.5289063E-01,                | 3.5268826E-01,  | 3.3118914E-01,  | 2.9177683E-01/  | DATA | 513 |   |
| 928 |     | DATA (RMOON (I)) I#361,1368,/ |                 |                 |                 | DATA | 514 | 6 |
| 929 | 551 | 2.3846021E-01,                | 1.7598889E-01,  | 1.0738053E-01,  | 3.5622458E-02,  | DATA | 515 |   |
| 930 | 552 | -3.6197419E-02,               | -1.0646469E-01, | -1.9279997E-01, | -2.2285930E-01/ | DATA | 516 |   |
| 931 |     | DATA (RMOON (I)) I#1, 361/    |                 |                 |                 | DATA | 516 | 6 |
| 932 | 561 | 5.9857723E-01,                | 6.0363628E-01,  | 6.0909292E-01,  | 6.1475433E-01,  | DATA | 517 |   |
| 933 | 562 | 6.2034286E-01,                | 6.2549537E-01,  | 6.2981698E-01,  | 6.3291879E-01,  | DATA | 518 |   |
| 934 | 563 | 6.3443316E-01,                | 6.3411363E-01,  | 6.3180913E-01,  | 6.2752104E-01,  | DATA | 519 |   |
| 935 | 564 | 6.2141516E-01,                | 6.1382844E-01,  | 6.0325987E-01,  | 5.9634135E-01,  | DATA | 520 |   |
| 936 | 565 | 5.8178450E-01,                | 5.8030316E-01,  | 5.7451879E-01,  | 5.7086768E-01,  | DATA | 521 |   |
| 937 | 566 | 5.6953572E-01,                | 5.7044270E-01,  | 5.7328251E-01,  | 5.760563E-01,   | DATA | 522 |   |
| 938 | 567 | 5.8291661E-01,                | 5.8875920E-01,  | 5.9477169E-01,  | 6.0070873E-01,  | DATA | 523 |   |
| 939 | 568 | 6.0642902E-01,                | 6.1187041E-01,  | 6.1700007E-01,  | 6.2178246E-01,  | DATA | 524 |   |
| 940 | 569 | 6.2614312E-01,                | 6.2991051E-01,  | 6.3301276E-01,  | 6.3509021E-01/  | DATA | 525 |   |
| 941 |     | DATA (RMOON (I)) I#37, 221/   |                 |                 |                 | DATA | 526 | 6 |
| 942 | 571 | 6.3592095E-01,                | 6.3525445E-01,  | 6.3288980E-01,  | 6.2871441E-01,  | DATA | 527 |   |
| 943 | 572 | 6.2274055E-01,                | 6.1513609E-01,  | 6.0624529E-01,  | 5.9659259E-01,  | DATA | 528 |   |
| 944 | 573 | 5.0686229E-01,                | 5.7784640E-01,  | 5.8035651E-01,  | 5.6510266E-01,  | DATA | 529 |   |
| 945 | 574 | 5.6258414E-01,                | 5.6296702E-01,  | 5.6609092E-01,  | 5.7149775E-01,  | DATA | 530 |   |
| 946 | 575 | 5.7854719E-01,                | 5.8653933E-01,  | 5.9482422E-01,  | 6.0287367E-01,  | DATA | 531 |   |
| 947 | 576 | 6.1031215E-01,                | 6.1691329E-01,  | 6.2257332E-01,  | 6.3103470E-01,  | DATA | 532 |   |
| 948 | 577 | 6.3388655E-01,                | 6.3582896E-01,  | 6.3681650E-01,  | 6.3675881E-01,  | DATA | 533 |   |
| 949 | 578 | 6.3852763E-01,                | 6.3298147E-01,  | 6.2899751E-01,  | 6.2351169E-01,  | DATA | 534 |   |
| 950 | 579 | 6.1655579E-01,                | 6.0829828E-01,  | 5.9907262E-01,  | 5.8939074E-01/  | DATA | 535 |   |
| 951 |     | DATA (RMOON (I)) I#73, 108,/  |                 |                 |                 | DATA | 536 | 6 |
| 952 | 581 | 5.7992906E-01,                | 5.7147822E-01,  | 5.6485037E-01,  | 5.6075086E-01,  | DATA | 537 |   |
| 953 | 582 | 5.5064246E-01,                | 5.6164595E-01,  | 5.6651451E-01,  | 5.7369134E-01,  | DATA | 538 |   |
| 954 | 583 | 5.8242736E-01,                | 5.9191684E-01,  | 6.0141348E-01,  | 6.1038594E-01,  | DATA | 539 |   |
| 955 | 584 | 6.1815781E-01,                | 6.2469887E-01,  | 6.2981355E-01,  | 6.350204E-01,   | DATA | 540 |   |
| 956 | 585 | 6.3584161E-01,                | 6.3694613E-01,  | 6.3693005E-01,  | 6.3588215E-01,  | DATA | 541 |   |
| 957 | 586 | 6.3385084E-01,                | 6.3084176E-01,  | 6.2682863E-01,  | 6.2177750E-01,  | DATA | 542 |   |
| 958 | 587 | 6.1368056E-01,                | 6.0859530E-01,  | 6.0068399E-01,  | 5.9224729E-01,  | DATA | 543 |   |
| 959 | 588 | 5.8374106E-01,                | 5.7576521E-01,  | 5.6901499E-01,  | 5.6419212E-01,  | DATA | 544 |   |
| 960 | 589 | 5.6188503E-01,                | 5.6244653E-01,  | 5.6590835E-01,  | 5.7196448E-01/  | DATA | 545 |   |
| 961 |     | DATA (RMOON (I)) I#109, 144,/ |                 |                 |                 | DATA | 546 | 6 |
| 962 | 591 | 5.8002849E-01,                | 5.8934273E-01,  | 5.9910201E-01,  | 6.0855987E-01,  | DATA | 547 |   |
| 963 | 592 | 6.1710112E-01,                | 6.2427876E-01,  | 6.2982127E-01,  | 6.361910E-01,   | DATA | 548 |   |
| 964 | 593 | 6.3369836E-01,                | 6.3618697E-01,  | 6.3527757E-01,  | 6.3319083E-01,  | DATA | 549 |   |
| 965 | 594 | 6.3014310E-01,                | 6.2632078E-01,  | 6.2186466E-01,  | 6.1686749E-01,  | DATA | 550 |   |
| 966 | 595 | 6.1138612E-01,                | 6.0546843E-01,  | 5.9918483E-01,  | 5.9266933E-01,  | DATA | 551 |   |
| 967 | 596 | 5.8615135E-01,                | 5.7997380E-01,  | 5.7458471E-01,  | 5.7049604E-01,  | DATA | 552 |   |
| 968 | 597 | 5.6820983E-01,                | 5.6812301E-01,  | 5.6043487E-01,  | 5.5098604E-01,  | DATA | 553 |   |
| 969 | 598 | 5.8175008E-01,                | 5.8987997E-01,  | 5.9879281E-01,  | 6.0776681E-01,  | DATA | 554 |   |
| 970 | 599 | 6.1612805E-01,                | 6.2331412E-01,  | 6.2891185E-01,  | 6.3267200E-01/  | DATA | 555 |   |
| 971 |     | DATA (RMOON (I)) I#145, 180,/ |                 |                 |                 | DATA | 556 | 6 |
| 972 | 601 | 6.3450652E-01,                | 6.3447349E-01,  | 6.3275308E-01,  | 6.2961689E-01,  | DATA | 557 |   |
| 973 | 602 | 6.2539259E-01,                | 6.2042648E-01,  | 6.1504697E-01,  | 6.0953411E-01,  | DATA | 558 |   |
| 974 | 603 | 6.0410031E-01,                | 5.9888639E-01,  | 5.9397478E-01,  | 5.8941717E-01,  | DATA | 559 |   |
| 975 | 604 | 5.8527074E-01,                | 5.8163342E-01,  | 5.7866755E-01,  | 5.7660216E-01,  | DATA | 560 |   |
| 976 | 605 | 5.7870859E-01,                | 5.7625096E-01,  | 5.7842156E-01,  | 5.8227865E-01,  | DATA | 561 |   |
| 977 | 606 | 5.8770476E-01,                | 5.9439927E-01,  | 6.0190373E-01,  | 6.0966649E-01,  | DATA | 562 |   |
| 978 | 607 | 6.1708940E-01,                | 6.2361290E-01,  | 6.2875948E-01,  | 6.3217371E-01,  | DATA | 563 |   |
| 979 | 608 | 6.3364482E-01,                | 6.3311622E-01,  | 6.3068351E-01,  | 6.2658221E-01,  | DATA | 564 |   |
| 980 | 609 | 6.2116538E-01,                | 6.1487122E-01,  | 6.0818134E-01,  | 6.0157235E-01/  | DATA | 565 |   |
| 981 |     | DATA (RMOON (I)) I#181, 216,/ |                 |                 |                 | DATA | 566 | 6 |
| 982 | 611 | 5.9346626E-01,                | 5.9018839E-01,  | 5.8594172E-01,  | 5.8280451E-01,  | DATA | 567 |   |
| 983 | 612 | 5.8075241E-01,                | 5.7969913E-01,  | 5.7954423E-01,  | 5.8021422E-01,  | DATA | 568 |   |
| 984 | 613 | 5.8168509E-01,                | 5.8398053E-01,  | 5.8714703E-01,  | 5.9121380E-01,  | DATA | 569 |   |
| 985 | 614 | 5.9614943E-01,                | 6.0182817E-01,  | 6.0801460E-01,  | 6.1437078E-01,  | DATA | 570 |   |
| 986 | 615 | 6.2048340E-01,                | 6.2590442E-01,  | 6.3019688E-01,  | 6.3297907E-01,  | DATA | 571 |   |
| 987 | 616 | 6.3396202E-01,                | 6.3298237E-01,  | 6.3001725E-01,  | 6.2520136E-01,  | DATA | 572 |   |
| 988 | 617 | 6.1882433E-01,                | 6.1131871E-01,  | 6.0323204E-01,  | 5.951105E-01,   | DATA | 573 |   |
| 989 | 618 | 5.8778894E-01,                | 5.8161181E-01,  | 5.7706724E-01,  | 5.8438246E-01,  | DATA | 574 |   |
| 990 | 619 | 5.7337735E-01,                | 5.7448836E-01,  | 5.7682632E-01,  | 5.8024982E-01/  | DATA | 575 |   |
| 991 |     | DATA (RMOON (I)) I#217, 252,/ |                 |                 |                 | DATA | 576 | 6 |
| 992 | 621 | 5.8443336E-01,                | 5.8911370E-01,  | 5.9410784E-01,  | 5.9930418E-01,  | DATA | 577 |   |
| 993 | 622 | 6.0463429E-01,                | 6.1003588E-01,  | 6.1541749E-01,  | 6.2063335E-01,  | DATA | 578 |   |
| 994 | 623 | 6.2547303E-01,                | 6.2966765E-01,  | 6.3291031E-01,  | 6.3488676E-01,  | DATA | 579 |   |
| 995 | 624 | 6.3531112E-01,                | 6.3396301E-01,  | 6.3072286E-01,  | 6.2560249E-01,  | DATA | 580 |   |
| 996 | 625 | 6.1876825E-01,                | 6.1033379E-01,  | 6.0145781E-01,  | 5.9212079E-01,  | DATA | 581 |   |
| 997 | 626 | 5.8327528E-01,                | 5.7566752E-01,  | 5.6995755E-01,  | 5.6661643E-01,  | DATA | 582 |   |
| 998 | 627 | 5.6584905E-01,                | 5.6756886E-01,  | 5.7143425E-01,  | 5.7693397E-01,  | DATA | 583 |   |
| 999 | 628 | 5.8349263E-01,                | 5.9056548E-01,  | 5.9770321E-01,  | 6.0458095E-01,  | DATA | 584 |   |



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600      629  6.1099513E 01,  6.1683737E 01,  6.2205716E 01,  6.2662307E 01/ DATA 585
601      DATA (RM00N (1),11,253,288,1/ DATA 586 6
602      631  6.3048943E 01,  6.3357298E 01,  6.3574363E 01,  6.3682967E 01, DATA 587
603      632  6.3363561E 01,  6.3493952E 01,  6.3167770E 01,  6.2668835E 01, DATA 588
604      633  6.2002427E 01,  6.1188559E 01,  6.0262284E 01,  5.9276887E 01, DATA 589
605      634  5.8301523E 01,  5.7415908E 01,  5.8701200E 01,  5.6227826E 01, DATA 590
606      635  5.6042841E 01,  5.6160622E 01,  5.8560363E 01,  5.7191416E 01, DATA 591
607      636  5.7984459E 01,  5.8864535E 01,  5.9762193E 01,  6.0620803E 01, DATA 592
608      637  6.1399777E 01,  6.2074405E 01,  6.2633322E 01,  6.3074800E 01, DATA 593
609      638  6.3602705E 01,  6.3622659E 01,  6.3738832E 01,  6.3751846E 01, DATA 594
610      639  6.3657995E 01,  6.3449760E 01,  6.3117624E 01,  6.2653097E 01/ DATA 595
611      DATA (RM00N (1),11,289,324,1/ DATA 596 6
612      641  6.2052590E 01,  6.1321527E 01,  6.0478184E 01,  5.9556723E 01, DATA 597
613      642  5.8403549E 01,  5.7750837E 01,  5.6911196E 01,  5.6318054E 01, DATA 598
614      643  5.5987798E 01,  5.5961590E 01,  5.6246038E 01,  5.6811249E 01, DATA 599
615      644  5.7897108E 01,  5.8525333E 01,  5.9513089E 01,  6.0484835E 01, DATA 600
616      645  6.1377205E 01,  6.2147427E 01,  6.2768560E 01,  6.3230011E 01, DATA 601
617      646  6.3933752E 01,  6.3690502E 01,  6.3715759E 01,  6.3626091E 01, DATA 602
618      647  6.3436067E 01,  6.3156174E 01,  6.2791972E 01,  6.2344743E 01, DATA 603
619      648  6.1813658E 01,  6.1199142E 01,  6.0906875E 01,  5.9751088E 01, DATA 604
620      649  5.8962048E 01,  5.8179858E 01,  5.7461413E 01,  5.6871816E 01/ DATA 605
621      DATA (RM00N (1),11,325,360,1/ DATA 606 6
622      651  5.5475461E 01,  5.6326531E 01,  5.6455431E 01,  5.6861822E 01, DATA 607
623      652  5.7812944E 01,  5.8349189E 01,  5.9294594E 01,  6.0268783E 01, DATA 608
624      653  6.1197227E 01,  6.2018342E 01,  6.2687342E 01,  6.3177352E 01, DATA 609
625      654  6.3478518E 01,  6.3595744E 01,  6.3545596E 01,  6.3352692E 01, DATA 610
626      655  6.3045821E 01,  6.2654082E 01,  6.2203486E 01,  6.1714485E 01, DATA 611
627      656  6.1200932E 01,  6.0670698E 01,  6.0127899E 01,  5.9576412E 01, DATA 612
628      657  5.9024041E 01,  5.8486391E 01,  5.7989274E 01,  5.7568613E 01, DATA 613
629      658  5.7267157E 01,  5.7128029E 01,  5.7186144E 01,  5.7459545E 01, DATA 614
630      659  5.7943320E 01,  5.8608033E 01,  5.9403161E 01,  6.0264816E 01/ DATA 615
631      DATA (RM00N (1),11,361,368,1/ DATA 616 6
632      661  6.1122043E 01,  6.1910136E 01,  6.2572109E 01,  6.3065495E 01, DATA 617
633      662  6.3364086E 01,  6.3458493E 01,  6.3553398E 01,  6.3075714E 01/ DATA 618
634      END DATA 619 6

```

29748 WORDS OF MEMORY USED BY THIS COMPILATION

71084 02 11-03-72 11.848 1980 EPHemeris

# PREFACE

PROGRAM BREAK 4273  
COMMON LENGTH 0  
V COUNT BITS 5

## PRIMARY SYMDEF ENTRY

TABLE 0

## SECONDARY SYMDEF ENTRY

BLOCK LENGTH

1 ERWBLK 11

## SYNREF

END OF BINARY CARD \*1980\*19

4273 IS THE NEXT AVAILABLE LOCATION.

GMAP VERSION/ASSEMBLY DATES JMAP 110171/102971 JMAP 110171/102971 JMPC 110171/102971

THERE WERE NO WARNING FLAGS IN THE ABOVE ASSEMBLY

\*\* 19421 WORDS OF MEMORY WERE USED BY GMAP FOR THIS ASSEMBLY.

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00 00 00 DATE 11-03-72 TIME 12.196 RR 0 09 DU051